those books intended for circulation.

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ARTICLE VII.—Any person removing from the hall, without permission from the proper authorities, any book, newspaper or other property in charge of the Library Committee, shall be reported to the Committee, who may inflict any fine not exceeding twenty-five dollars.

ARTICLE VIII.—No member or holder of second class stock, whose annual contribution for the current year shall be unpaid or who is in arrears for fines, shall be entitled to the privileges of the Library or Reading Room.

ARTICLE IX.—If any member or holder of second class stock, shall refuse or neglect to comply with the foregoing rules, it shall be the duty of the Secretary to report him to the Committee on the Library.

ARTICLE X.—Any member or holder of second class stock, detected in mutilating the newspapers, pamphlets or books belonging to the Institute shall be deprived of his right of membership, and the name of the offender shall be made public.

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Some Causes of the Decline of our Trade, and their Remedy.

Lecture by Henry Mitchell, Esq., J.P., of Bradford.

It is no party question on which I am about to speak. I am not here as a politician in any sense of the word, nor am I here as a Protectionist. I would like to see every custom house in the world destroyed, but that is a matter beyond the power of any individual, or any one country or nation. I had the honour of meeting the Emperor of Brazil at the Philadelphia Exhibition; he was a most active and intelligent man. Amongst other things he noticed that the Americans were building some substantial custom houses, which apparently would last 300 or 400 years. He remonstrated with them very strongly, and told them no such institutions would be required 100 years hence. But the question with us is, what we are to do under present circumstances. We are told by many physicians that the time is not far distant when pain and physical suffering will be practically abolished, and that our life will be carefully prolonged, and that medicine will be so sweet that men can take it with the greatest pleasure and gusto. So, 100 years hence, there would be free commercial intercourse between all nations of the world, and there would be no need of custom house officials. But it will be no satisfaction to find, whilst that time is coming, that our capital is gradually becoming less, and our orders are decreasing; nor is it any satisfaction to the operatives to find their wages declining, and to find that employment is very difficult to obtain. Therefore it is our duty to consider what is the best policy to advocate under the circumstances in which we find ourselves placed. Before referring to the alleged causes of the decline of our trade and commerce, I think it is well to take a review of the period prior to the year 1872, when our commerce reached its climax. There is no period in history in which there has been such a wonderful progress and such a marvellous development of our trade, as there was from the year 1840 up to 1870. Those who are old enough would remember that before that time everything was done by hand. As a consequence of the introduction of machinery, we know that the products of our looms are five or six times the amount they were 40 or 50 years ago. Then again, there was the introduction of railways, bringing us not only into communication with every part of our own country, but every part of the world. Not only was there this advantage of communication with every part of the world, but the material for making railways was produced in England. The consequence was from this cause alone that the growth of our national wealth was stimulated enormously. Then they had steam communication with every part of the world. The telegraph now brings us into daily converse with all nations of the earth. The gold discoveries in California and other places also contributed enormously to the wealth and growth of this country. In addition to that we had, unboubtedly, the adoption of free trade, or rather free imports, for we never had free trade, and that contributed very largely to the development of the wealth and commerce of this country. At that time other nations were largely dependent upon us for the leading staples, such as cotton goods, woollen goods, linen goods, worsted goods, mixed fabrics, and iron manufactures. The abolition of import duties enabled other countries to send us large quantities of products, and they were enabled, in return, to take from us very largely indeed our manufactures. Now, however, we find ourselves in very altered circumstances. America, which at one time was one of our largest customers, is now producing to an enormous extent the goods, fabrics, and material which we exported so largely into that country so many years ago. One of my colleagues at the Philadelphia Exhibition estimated the total value of these products at more than thirty millions sterling, which was largely in excess of the total of our imports of that class of goods, and the production of these goods is still increasing, and increasing to a very large extent indeed. Then we know that Russia, Germany, Belgium, and most of the Continental countries, are manufacturing those goods for themselves, whereas they formerly took them from us. We have lost of our worsted industry alone from Germany and the United States of America, during the last eight or ten years, more than eight millions sterling. This amount is sufficient to ruin any ordinary town. We have also lost more or

less from other countries, but a far larger amount has been from Germany and the United States. We must always have fluctuations in business, and just as storms come in the natural world, and purify the atmosphere, so panics come in the commercial world, and purify the commercial atmosphere; but these pass away quickly. If we look back for the last seven or eight years, we find we have not been suffering so much from commercial panics, as from a steady decline in our trade from year to year and month to month. Undoubtedly bad harvests, and a succession of bad harvests, have had a great deal to do with it. But we have suffered from bad harvests before, and other countries have also suffered from bad harvests, and they have not had the same continued depression in business as has been experienced in England. We cannot speak too strongly of the drink bill of this country which is far too heavy, and we ought to give all honour to those gentlemen who are calling attention to this question, and who are trying te impress npon the people the general necessity of temperate habits. There is no doubt whatever that intemperance is an incalculable injury to the individual and to the country. To the individual it is often a loss of health as well of means of subsistence; it often shortens life and brings want and poverty to the family, and to the nation it is a very serious loss indeed, inasmuch as it brings many thousands a year to the workhouse who ought to be earning an honest livelihood. But I don't think the country has been more intemperate during the last eight or ten years than it was prior to that time—I think it has been more temperate, if we consider that the population has increased whilst the drink bill has not been increased, but remains nearly stationary. Extravagance in living is another cause. There is no doubt all classes during the prosperous times some years ago were led into larger expenses than prudent men ought to have incurred. Then undoubtedly speculation is another cause. Another alleged cause is the operation of the land laws. If there are obstructions which prevent the full development of the resources of this country to prevent agriculturalists from producing all the country is capable of producing, then I say these obstructions must be removed. It must not be looked upon as a party question at all. When the question does come to be discussed, I hope the country will be practically unanimous in insisting upon the removal of these obstructions. Then the want of a careful scientific and technical training of our operatives in their respective industries is another cause. Why, we have not kept abreast with other countries, who have given a careful technical training to their artisans, and which has enabled them to produce a higher class of goods, and at any to surpass us. I am glad this subject is now occupying the attention of this country, and as you will have observed, two royal commissioners have already been engaged by the Government to visit the technical schools on the Continent, and I believe others will be asked to join them. No district more needs technical education than the one in which we live, where we are using the materials of wool, silk, cotton, &c., all capable of manipulation into an infinite variety of fabrics. Therefore this country has not had all the advantages it can have in obtaining information with regard to technical schools. Some of the continental nations were a long way behind us 20 years ago, but they may now be said to be abreast of us, and in some senses ahead of us, and for that they are largely indebted to these schools. At the exhibition of 1851, in this country, people saw the fabrics in which Bradford and Halifax excelled, and there was hardly anything, except of the rudest form, either from America, Belgium, or Germany, at any rate there was very little indeed; but if you had gone over to the Philadelphia Exhibition, in 1876, you would have noticed that the effect was most surprising. Another fact it is my duty to mention is, there has been exported from this country, during the last eight or nine years, to America and the continent of Europe, more than £30,000,000 of mill-work and machinery. You have in that fact an unanswerable reason why the people are not able to take the quantity of our fabrics they did formerly, and we cannot expect they will ever take the quantity again. Then we have heard complaints about the Factory Acts. You are all aware that the hours of labour are much shorter in England than in America or the continent of Europe. I am not a manufacturer myself, therefore I am not looking at this question from a manufacturer's point of view. But I should be very sorry to have the Factory Acts altered in any way. There are moral and physical conditions to influence our judgement to decide that women and children ought not to work twelve hours a day, six days a week. I believe it is the custom in some continental countries for young children to go to the factory at four and five o'clock in the morning and work till seven at night, and in some places they also work on Sunday as well as on week-day. You will all agree with me we can't run a race with manufacturers who use their workpeople in that way. Lord Macaulay has expressed his views very beautifully on the question of the claims of the working man to leisure and recreation, in his speech on the Factory Acts, and his views just coincide with my own. He says:—"Man is the great instrument that produces wealth. The natural differences between Campania and Spitzbergen is trifling when compared with the difference between a country inhabited by men full of bodily and mental vigor, and a country inhabited by men sunk in bodily and mental decrepitude. Therefore it is that we are not poorer, but richer, because we have through many ages rested from our labours one day in seven. That day is not lost. While industry is suspended, while the plough lies in the furrow, while the exchange is silent, while no smoke ascends from the factory, a process is going on, quite as important to the wealth of nations as any process that is performed on more busy days. Man, the machine of machines, the machine compared with which all the contrivances of the Watts and the Arkwrights are worthless, is repairing and winding up, so that he returns to his labours on Monday with clearer intellect, with livelier spirits, with renewed corporeal vigor. Never will I believe that what makes a population stronger and healthier, and wiser and better, can ultimately make it poorer." Then another cause is the enormous military expenditure going on in the world. We hear a great deal also about our military expenditure. Undoubtedly it is true that the enormous military expenditure of countries, especially of countries on the Continent of Europe, has interfered with the producing and purchasing powers of these nations. It is not, however, by commercial speculation alone, or chiefly, that the commerce of Continential Europe has been reduced to its present state of depression. The rivalries of military despots, the devastating wars which they have waged, and the bloated armaments they maintained even in time of peace, have brought a larger share of ruin in their train than all the errors of the commercial classes. In the armies of the five chief European powers more than 2,000,000 men are permanently under arms, and the annual expenditure on the fleets and armies of the so called civilised world exceeds £150,000,000. Some idea may be formed of the extent to which the power of the taxpayer to purchase commodities has been abridged from this cause, when it is mentioned that since 1860 the National Debt of the world, debts incurred mainly for war purposes, have been increased, according to the computation by Mr. Wells, by a sum exceeding 10,000,000,000 dollars. That was a very powerful cause indeed why nations, incurring a large military expenditure, are not able to expend so much money as they would do in the purchase of useful commodities We have got almost every possible cause for the decline of our trade, except one, and that is the enormous tariffs which foreign countries are imposing on our goods. America takes hardly anything from us except at from 60 to 70 per cent. duty. The duty ranges from 60 to 130 per cent., and in some particular cases it is as much as 300 per cent. Of course with such a tariff, it can only be a ques ion of time when the trades in question must be annihilated. We had but little business last year, and it was followed this year by a large decline— a decline in Bradford goods alone of £50,000 a month. The tariffs placed on our goods by Russia are practically pro hibitory. Germany is largely increasing her tariff, and we are threatened by France with a duty on textile fabrics more than double. This cause, coupled with the progress which foreign nations have made, has contributed more than those I have named to the loss of the trade and commerce of this country. We hear a great deal about the balance of trade, and we have had a great many pamphlets circulating on this question. Some of them are very amusing, and some of them are very misleading. I may here state that my facts and figures have been gathered from the most competent amthorities. I shall not understate or overstate anything knowingly. My object is to get at the truth.

(*To be continued in our next*).

The Woollen Exhibition at the Crystal Palace.

The jurors of the International Exhibition of Wool and Woollen Manufactures and allied Industries, held at the Crystal Palace, have made their award of prizes, amongst which will be found the following :—The gold medal of the Worshipful Company of Cloth-workers has been awarded to—(2) George Armitage, Bradford, for the best navy-blue worsted coating: (5) J. Radcliffe & Co., Rochdale, for the best piece of bleached flannel, the bleaching of which has been effected without the use of sulphuric acid in any form; (12) A. & S. Henry & Co., Bradford, for ladies' dresses of English wool; (15) also A. &. S. Henry & Co., for ladies' ulsters of English wool; (14) Hargreaves and Nusseys, Leeds, for ladies' winter mantles or jackets of English wool.

The gold medal of the Worshipful Company of Drapers, has been awarded to—(1) Sir Samuel Wilson, Melbourne, for washed combing wool; (6) the Huddersfield Chamber of Commerce, for the best collection of six samples of combed wool fabrics; (7) Marling & Co, Strand, for the best collection of six samples of carded wool fabrics, milled or unmilled; (8) A. & S. Henry & Co., Bradford, for best collection of combed wool fabrics, of not less than six samples mixed with cotton, silk or hair; (9) W. & J. Galloway & Sons, Manchester, for engine and shafting working and machinery in motion.

The following are amongst the awards made by the jurors in the respective classes:—

Class 1.—Machinery.—The grant of the Worshipful Company of Merchant Tailors, for prize medals for Machinery has been applied as follows:—Gold medals.—Platts Bros & Co., Limited, Oldham; John Eatham, Rochdale; G. Hodgson, Bradford. Silver Medals.—Houghton, Knowles & Co., Leeds; Hutchinson, Holingworth & Co, Limited, Dobcross, near Manchester; John Leeming & Sons, Bradford; Asa Lees & Co., Limited, Oldham; J. & W. McNaught, Rochdale; J. Petrie, Junr., Rochdale; J. H. Riley & Co., Bury; L Webster, Batley Carr. Bronze medals.—Aublet, Harry & Co., London; Burgon & Ball, Sheffield; James Hesslewood, Leeds; John Ingram & Sons, Thornton; Kemp & Co, Leeds.

Classes 2 *and* 3.—Woollen and Worsted Fabrics.—Silver Medals.—Maple & Co., London, for furniture stuffs; Randal and Way, London, for carded and combed wool cloths, and fine black cloths; Huddersfield Chamber of Commerce, for general exhibits; D. & J. Cooper, Leeds, for general exhibits; T. Riley and Co., Bradford, buntings; John Oakes & Co., Halifax, dyed serges; Whitaker Bros. & Co., Newlay, near Leeds, dyed serges and milled cloth; A. & S. Henry Co, Bradford, for worsted coatings of low price, with excellence in workmanship and finish; also for a new mohair cloth, designed by a pupil of the Bradford Technical School.

Class 4.—Carpets and Rugs—Silver medals—J. Crossley Sons & Co., Limited, Halifax; J. Humphries & Sons, Kidderminster; W. S. Lawson & Co., Leeds; Maple & Co., London; Tuberville Smith & Son, London: Yates & Co., Wilton.—Bronze medals—Blackwood & Bros, Kilmarnock; Watson and Naylor, Kidderminster.

Classes 6, 7 *and* 8.—Raw Wools, Hair and Skins—Silver medals—J. & T. Beavan, Holt, Trowbridge, for superior English down fleeces; J. & T. Beavan, for middle wools: S. Brier & Co, Halifax, for very superior exhibit of English varieties; S. Brier and Co., for clean long wool; J. H. Caswell Laughton, Falkingham, Lincoln, for very superior Lincoln fleeces; Grist Bros., for selection of shoddy and mungo. Bronze medals have been awarded to various firms.

Bernhard Samuelson, Esq., Fellow of the Royal Society: Henry Enfield Roscoe, Esq., Doctor of Civil Law, Fellow of the Royal Society; Philip Magnus, Esq, Bachelor of Arts, Bachelor of Science; John Slagg, Esq., Swire Smith, Esq., and William Woodall, Esq., have been appointed a Royal Commission to inquire into the instruction of the industrial classes of certain foreign countries in technical and other subjects, for the purpose of comparison with that of the corresponding classes in this country and into the influence of such instruction on manufacturing and other industries at home and abroad.

COTTON MANUFACTURE IN AMERICA.

The "cotton year," statistically, ends September 1st, when the preceding year's growth is substantially all marketed, and the picking of the new crop is well under way, this part of the work extending up to the end of the year, and sometimes later. It is now certain that the crop of 1880-81 will exceed that of 1879-80, which was 5,761,252 bales, and was the largest crop ever raised in the country up to that time. The receipts reported up to August 10th, were 5,735,356 bales, against 4,914,226 bales to the corresponding date last year. The quantity of cotton in a bale varies, although the improved machinery for compressing and baling has tended to make all bales heavier the last few years. The total weight of the last crop was 2,771,797,156 pounds, the lightest bales being of Sea Island, weighing 384·55 pounds, and the other descriptions varying from 460 to 509 pounds. Beside the American growth, India and Egypt together contribute about 1,500,000 bales annually to the world's supply of cotton, but of so different a quality as to effect but little the sale of the American staple with prices ruling as low as they have for a few years past. Especial significance will be given to these figures this year, and to everything pertaining to the cultivation and manufacture of this great staple, by the exhibition to open at Atlanta in October, all the preparations for which are in a very forward state, and give promise of affording a worthy representation of the vast interests concerned. Many had wished that such an exhibition might have been held in some northern city, near the principal centres of manufacture, but this would have reduced to a minor place what will be a leading feature of the coming show—the illustration of the conditions under which the crop is raised, and the practical working of the appliances by which it is made ready for market The exhibition coming as it does right in the harvesting period, and in a locality where the gathering of the crop can be personally investigated by all visitors, will present more vividly to the minds of mechanical inventors, and business men, many questions of importance which have hitherto received comparatively little notice. These include not only such as relate to the merits of different improved gins and various devices to facilitate the picking and bettering the average condition of the crop, but the larger problems connected with the possibilities of the future in the more extensive utilization of the seed and the stalk for the production of oil, feed, paper, a substitute for jute, &c.

We have had a large and healthy growth in the manufacture of cotton goods, for a few years past, which has covered a substantial development in this branch of industry in the South itself, where the factories already in operation are making good dividends and many new ones are projected. But we do not as yet make up into finished goods more than about one-third of the cotton we grow. In this department of industry Great Britain has long been a great way in advance of all the rest of the world, taking about one-half of our raw cotton, and nearly all of that furnished by other cotton growing countries.

For the past few years times have been "rather hard" with her in this speciality, as in many other manufactures, but the falling off in actual amount of production seems to have been due rather to a depressed state of trade generally than the competition of manufacturers elsewhere. For the four years between 1870 and 1875, her production exceeded 500,000,000 dollars annually, the raw cotton costing from one-third to two-fifths of this amount, and the remainder going to pay for English labour and capital. About one-fifth of this great total was exported, while our own exports of cotton goods for those years averaged about 3,000,000 dollars yearly; they have since reached 11,000,000 dollars; but our imports of cotton goods in 1880, notwithstanding a pretty stiff tariff, were but little below 30,000,000 dollars.

We come next to England in the manufacture of cotton goods, running more spindles than France and Germany together, but how far behind her we still are these figures too plainly indicate. Undoubtedly lower wages and cheaper capital give the British manufacturer his principal advantages, to which are to be

added better means of communication with different markets, long established connections, &c.; but with all these in his favour he has been especially alert, within a few years past, in seeking out and originating improvements in the machinery required in the business. Marked advances in this direction have been made in the cotton industry quite recently, and there is hardly any detail of the business for which some new device or machine has not been brought forward. The value as to advancement in the product, or economical performance, of many of these supposed improvements are yet matters of debate in the trade here, but the exhibition at Atlanta, in which British manufacturers of cotton machinery are to be prominently represented, ought to be of great advantage to our manufacturers generally, on account of the comparisons they can then make of their practical working. If the exhibition can effect anything to improve our chances of successfully competing in many foreign markets now closed to us, so that we shall export more largely of finished instead of raw cotton, thus widening the field for the employment of American labour and capital, its influence upon industry, both here and in England, will be great.—*Scientific American.*

ENGLAND AND FRANCE.

THE OLD AND NEW TREATY.—With a view to enable our readers to draw a comparison between the duties levied under the old treaty, and those proposed by France for a new one, on Textile Manufactures generally, we give the following table:—

Manufactures.	Present Rate of Duty. Per cwt. £ s. d.	Proposed Rate of Duty. Per cwt. £ s. d.
Carpets, tapestry	10 per cent.	1 10 0
,, velvet	10 per cent.	2 0 3
,, Eastern	10 per cent.	3 15 7
,, Brussells, Wilton, and Kidderminster chenille (Axminster), &c.	10 per cent.	2 10 4
of wool, and other materials mixed	10 per cent.	Pay as carpets of pure wool.
,, Jute, short or long nap	0 9 9	0 10 1
Curtains, muslin embroidered, not bordered, weighing less than 18½ lb. to the 100 sq. yards	15 per cent.	6 1 11
weighing 18½ lb. or more	15 per cent.	12 3 10
of tulle or grenadine	15 per cent.	18 5 9
Muslins, embroidered or figured for furniture hangings, unbleached	10 per cent.	7 6 3
Hangings (tapisseries)	10 per cent.	12 11 10
Lace	10 per cent.	7 11 2
Upholstering Fabrics, &c., of Pure Wool:—		
Stuffs for furniture, weighing more than ¾ lb. to sq. yard	10 per cent.	2 10 5
Moiré	10 per cent.	1 10 5
Other stuffs, weighing ¾ lb. to the sq. yd.	10 per cent.	4 5 6
,, from ¾ lb. to 1 lb. to the sq. yd.	10 per cent.	3 15 6
,, above 1 lb. to the sq. yd	10 per cent.	3 5 6

THE INDIAN BUDGET.

On the 22nd of last month, the Secretary of State for India made his financial statement to the House of Commons, presenting three different sets of figures. First there were the corrected accounts for the year 1879-80. Then there was the regular estimate, as it is called, for 1880-81. Lastly, came the prospective or Budget estimate, for 1881-82. But the accounts presented were affected in form by the English contribution to the expenses of the Afghan war. The sum, amounting to five millions, was made up partly of a remitted loan of two millions, and partly of six half-yearly payments, of half-a-million each. But in order to balance revenue and expenditure, the two millions were entered for the year 1880-81, and the three millions for 1881-82. On the audited accounts for 1879-80 there was a general increase over the estimate both of revenue and expenditure, the deficit being slightly less than in the Budget for 1877-78. In 1880-81 there was a deficit of more than six millions, although the revenue was greater by four millions than it was estimated in the Budget of last year. The increase in receipts was due to opium, the increase of ten millions in expenditure was due solely to the Afghan War. Thus in the Budget estimate for 1881-82 there was reckoned a surplus of more than three-quarters of a million, more than eleven millions being deducted from expenditure on account of the war being no longer included. This, indeed, appeared to be a modest estimate, a considerable diminution in the receipts for opium being discounted. This was done, as Lord Hartington explained, out of what lawyers call abundant creation. Opium was so uncertain an item in Indian finance that the reality very seldom came within half a million of the anticipation. Hence the prudence which reckoned on its diminution by two millions next year may prove to have been unnecessary, though it was by no means misplaced.

Improved Looms for Weaving Axminster Carpets.

Some twenty years ago Mr. John Orr proposed, in the manufacture of chenille Axminster carpets, to dispense with winding the chenille weft or "fur" on a stick or staff, and to weave it off a reel placed at the side or back of the loom; he also proposed to employ a reed with every third space left opened at the top, and with the intermediate dents bent together and united so as to present sharp points by which the catcher warps were guided into their proper splits. In lieu of operating the catcher warps by heddles, he intended to pass them through the eyes of needles, which operated them at the required times, and it was further proposed to mount the catcher warp beam upon or in connection with the needle frame, so as to move therewith. The arrangements for carrying the invention into effect were, however, crude and ill-considered, and are believed to have never been successfully put into operation.

According to a recent invention, patented by Mr. W. Adam, of the firm of Tomkinson and Adam, of Kidderminster, the chenille weft or fur can be successfully woven from a beam or bobbin, or from a basket. In carrying the invention into effect, a bar of needles set to the required gauges is employed, and through the eyes of these the "catcher" or binding warp passes from a small roller or bobbin with flanged ends, on which it is wound. The bar of needles is fixed to a frame mounted with capability of being moved up and down in suitable fixed guides carried by the framing of the loom. The catcher warp roller or bobbin is mounted in bearings carried by the needle frame just above the needle bar, and moves up and down with it, and such catcher warp roller or bobbin is provided at one or both ends thereof with suitable taking-up appliances.

In order to allow the catcher warps to enter their respective spaces in the sley or reed, the latter is made, as has before been proposed, in the form of a comb, with spaces at intervals through which the catcher or binding warp passes in order to make a shed; the top of the dents between the open top spaces are united together and filled in solid, and the outer dents are formed in one strip of metal, bent over at the top so as to give increased strength to such parts. The front or face of such solid tops is inclined slightly forwards from the upper to the lower part thereof for the purpose hereafter described.

The chenille weft or "fur" is wound on a beam or large bobbin, or it may be placed in a basket. The beam, bobbin, or basket is placed in any convenient position, and the end of the chenille weft or "fur" is passed through one or more guides carried by a slide, which runs to and fro on one or more guide rods or bars fixed to the loom behind the catcher warp needles, and such slide is moved at the required times from one side of the loom to the other, carrying the chenille weft or "fur" with it ready to be pulled through at the end of its course between the lower ends or points of the needles at the top of the sley or reed; or by forming the slide with a projecting finger carrying the guides, and travelling between the top of the reed and the points of the catcher warp needles, the chenille weft or "fur" will be carried across the loom in front of the reed, in which case

such weft or "fur" will only require to be pulled by the attendant to the fell of the work. The reed is then moved forward in such a position that the bottom edge of the solid tops of the reed shall ride upon the ground warps and press the chenille weft or "fur" to its proper place, to assist which the lathe with the reed or sley has a rising motion imparted to it just as it is completing its forward motion, thus bringing the fur to its proper place without the aid of a comb, which it has hitherto been found necessary to employ in this class of loom. When beating up the ground weft, the reed or sley is moved to and fro in the ordinary manner, but when pressing the chenille weft or "fur" to its place, the motions above described are imparted to it.

The slide employed in carrying the chenille weft or "fur" into the open shed may be operated in any convenient manner, but the way I have found it to answer, says Mr. Adam, forms part of the present invention, and consists in attaching one end of a cord or other flexible connection to each end of the slide, and passing such flexible connections partly around one or more guide-wheels at each side of the loom, whence they pass to wheels fixed one at or near each end of an axle, which receives the required reciprocating rotary motion at the proper times from a cam and suitable connections.

The Woolsorter's Disease.

The following is a copy of the report on anthrax, or woolsorters' disease, presented to parliament by Professor Brown:—

"Veterinary Department of the Privy Council Office.

"Sir,—Referring to the report of Mr. John Spear, of the Local Government Board, on the subject of the woolsorters' disease (anthrax), and the questions in the House of Commons as to the intention of the Privy Council in regard of legislation for the prevention of anthrax among animals in this country, arising from the use of the refuse of wool manufactures for manure, I have the honour to submit the following points for the consideration of the Lord President:—

"1. The inquiry recently conducted by Mr. Spear at Bradford has established the fact that the woolsorters' disease, which was first observed forty-three years ago, when the import of mohair commenced, is a form of anthrax, a disease which is due to the presence of a microscopic plant, the Bacillus anthracis, in the fluids of the body.

2. "Anthrax is essentially an affection of the lower animals, but is as readily communicable to man as to the lower animals by the introduction of the spores of the Bacillus anthracis into the blood.

"3. Anthrax, in the form of splenic fever, has long been known in this kingdom as a disease which occurs occasionally among farm stock. The affection, does not, however, spread to any extent by contagion, and as a rule does not extend beyond the farm on which the outbreak occurs. The disease is more virulent in some parts of Ireland than it is here, and on the Continent it sometimes prevails extensively. The Siberian plague which is now rife in Russia, is one of the most virulent and fatal forms of this disorder. It may be remarked that anthrax is one of the diseases which are distinguished by periods of excessive prevalence and decline.

"4. It may be accepted as a fact that the use of wool, hair, and other substances from animals which have died of anthrax, in agriculture or manufactures is attended with danger to men and animals.

"5. So far as animals are concerned, the risk of the communication of anthrax through the agency of the refuse of wool factories used as manure is comparatively slight, and might be further diminished by limiting the use of such refuse to arable land.

"In this connection the most important thing seems the adoption of means to make farmers aware of the danger which attends the employment of the refuse of wool mills as top dressing for pastures. It can hardly be imagined that the refuse would be used for this purpose if it were known that the risk of introducing anthrax would be incurred thereby. It has been suggested that the sale of wool bags and the refuse of wool factories should be prevented; but the measure could hardly be justified on the evidence which has been adduced as to the injury which such substances are likely to cause. I am not aware of any outbreak of anthrax having been traced to the use of wool bags for any purpose, and there is only one instance recorded of the appearance of the disease under circumstances which afforded reasonable ground for concluding that it was due to the use of sewage mixed with wool refuse on land where cattle were grazing.

"A more serious aspect of the question is the danger to which the woolsorters are exposed, owing to the mixture in the bales of wool of inferior sorts of wool, some of which have undoubtedly been clipped from the skins of animals which have died of anthrax. Mr. Spear suggests that in preference to a total prohibition of the importation of this inferior wool, which would continue to be imported even if it were prohibited, it should be imported separately, in such a form that it could be dealt with on landing by being disinfected or otherwise treated as might be found necessary to render it harmless.

"While agreeing with Mr. Spear in his view of the desirability of an arrangement of this sort, I may be permitted to point out that legislation could not prevent the foreign exporter from mixing the inferior with the best quality of wool, and in order to detect this fraud it would be necessary to sort the wool while in charge of the Customs, a proceeding which would merely divert the risk of disease from the workers in the factory to the examining officers, who at the same time must be skilled woolsorters, in the Custom Houses. It may, however, be assumed that all illegally mixed wool would be confiscated and destroyed, and the loss to the importer would in time have a deterrent effect.

"The examination of wool and hair at the place of landing would necessitate the appointment of special officers, as the officers of Customs could not undertake the work; indeed, they do not possess the necessary technical knowledge, even if they could devote the time which would be required for the efficient performance of the duty.

"I have, &c.,

G. T. Brown."

BRITISH ASSOCIATION.

COMMERCIAL GEOGRAPHY.

Mr. Edward J. Watherston read the following paper, which was on the subject of the societies of commercial geography recently established in Germany. The objects of the societies are twofold—first, to give to their members, nearly all merchants and manufacturers, the latest reliable information relating to the channels into which the export trade of the country should be directed; secondly to establish agencies in all the principal commercial towns of the world. He recommended the establishment of similar societies in this country, with a central society in London working through the existing Chambers of Commerce.

Mr. Hyde Clarke thoroughly agreed with the writer of the paper, and observed that although most valuable reports had been issued by various Parliamentary Commissions, we had till now been content to sleep upon them. In this time of universal competition, however, it was necessary to take active steps. The plan suggested by Mr. Watherston did not require large subscriptions or the possession of considerable pecuniary means, but would mainly depend on the voluntary exertions of men of science, who would supply the public with the information they needed. There was hardly a part of the world in which the supremacy of our trade was not being sapped by the Germans, and that was largely due to the fact that German emigrants far more than English emigrants acquired a knowledge of the language and commercial wants of their new abode.

Professor Leone Levi (London) said that he considered that the formation of special societies for the diffusion of geographical knowledge was scarcely necessary. It was either an educational or a Government question: instead of being treated as a question of technical education and commerce, it should be dealt with by educationalists, by colleges, and technical schools. It was much to be regretted that in the efforts for promoting technical education commercial education was not yet included, and it ought to be the aim of that section to commend this

particular question to those who had at heart the technical education of the people. The technical schools of commerce in Venice and Paris, and the chief marts of commerce in Europe, were affording considerable benefit, and if the guilds and those engaged in extending technical education could do something in that direction, they would confer a great benefit on the country. As to the action of the Government in the matter he regretted that the Board of Trade returns were for purposes of geographical knowledge, almost useless, seeing that they were not arranged in geographical order; and a little more attention to geographical arrangement would be of great benefit.

Mr. HIRST (of Greenwich) thought that some of the disadvantages the trading community suffered from arose from the fact that information was too general, and distributed over a greater area than formerly. The result of this was that a larger number of persons sent out goods than was the case in past years and so the markets were glutted

Mr. W. BOTLEY observed that the ill success of farmers in this country was attributable in a large degree to their ignorance of the market value of their produce.

SIR C. FIRTH, in supporting Mr Watherston's views said it was most important that British manufacturers should know, for example, how many spindles were being erected in foreign lands to produce the same kind of goods as he was produceing. Speaking as a manufacturer, he got no information of this kind from his agent, because he supplied an English merchant. If a commercial geography society were established on the plan suggested by Mr. Watherston it would be a good thing for Yorkshire manufacturers, many of whom, since Germany put her tariff on, had been induced to erect works in that country. In other directions, too, the Germans were entering into close competition with us, and he hoped that something would be done in the way suggested by Mr. Watherston, so that they might have full information on the subject. He did not, however, think that much could be done through the agency of one society, or even through the agency of Chambers of Commerce. He thought it would be better that each of the great industries, especially cotton and wool, should have a society of their own.

Mr. WATHERSTON, in reply, disagreed with the criticisms of Mr. Leone Levi. It would be difficult to engraft a knowledge of commercial geography in technical schools, and a long time would elapse before the requisite knowledge was disseminated. With such a society as he suggested they would be able to get, at a comparatively small cost, a paid secretary, who would devote himself to the getting of information relating to the commerce of foreign countries, and condensing and indexing it so as to make it available for popular use. The English had a great deal to learn from foreigners, especially the Americans, as to the way in which they prepared their statistics.

Railway Rates for Conveyance of Wool.

A special meeting of the committee of the Rochdale Merchants and Tradesmen's Association was held on the 18th ult., under the presidency of Mr. Wm. Kershaw, for the purpose of enquiry into the rates charged by the Lancashire and Yorkshire Railway Company for the conveyance of goods. Mr. Joseph Law produced statistics showing that the rates charged for the carriage of wool and general merchandise to and from London was considerably higher than to other towns. From London to Rochdale the Company charged £1 17s. 6d per ton, whereas to Oldham the rate was only £1 10s.; Bury £1 11s. 8d.; Bolton £1 11s. 8d.; Manchester, £1 10s. Mr Law suggested one or two other ways by which goods could be carried to Rochdale at a much less rate. Several members urged the necessity of immediate and vigorous action to obtain redress It was resolved unanimously that a circular should be addressed to the woollen manufacturers and woolstaplers in the district inviting their co-operation, and that a committee should be formed to take such action as might be thought desirable.

It is announced in the *Daily News* that the Government is endeavouring to draw closer the commercial relations between this country and Spain, Portugal, and Italy.

The Bank Rate.

*** The rise in the Bank rate is certainly an event of considerable importance. It is nearly three years since the rate stood at 4 per cent. Many people thought it would not be increased at present beyond 3½ per cent. But there is no reason for the alarmist theories that are current in some quarters The effect of the present rate upon trade cannot very well be injurious; it is more likely to be the reverse. In fact, the measure is chiefly one of precaution, which will not affect sound business, but may be expected to put at least a temporary stop to risky speculation.

ART NOTES FOR DESIGNERS.

A COURSE OF STUDY FOR ART STUDENTS.

At the annual meeting of the Sheffield School of Art, Mr. J. B. Mitchell-Withers, the president, delivered the following address. He said:—It is my duty to-night to address you for a few moments on the subject of art; and if I felt that I was expected to say anything novel bearing on its history or technical practice, I should hesitate to speak at all before an assembly like this, embracing, as it does, not only those who have shown their attention to it by carrying off the prizes we are about to hand them, but also some whose brows have long been adorned with the laurels of painting, sculpture, and architecture, and to whose words I should be no unwilling listener. I shall confine myself. then, to a rapid glance at the opportunities afforded in this Sheffield of ours to acquire the knowledge necessary to form a true artist. I do not restrict this term to any one branch of art, and I feel I shall be pardoned when I say that although it is to be hoped that some true painters may be the outcome of this school, it certainly is not its primary object to produce them. We seek to gather within its walls not only the sculptor but the stonemason; the joiner as well as the wood carver; the chaser, the engraver, the ironworker; in fact, all on whose daily avocations art can be brought to bear. Nor do we wish to stop here. We would desire to have a firm hold on those who will have the opportunity of employing the art workman, to give them a true interest in art, which can only be truly acquired by definite and systematic study. There is little doubt that in these days art is not neglected. We have "art pottery," "art colours," "art furniture," a series of papers devoted to "art at home," and many volumes to art abroad; but to use the words of our late art director, Mr. Poynter, "It cannot be denied that in spite of all that is talked and written in sincerity and cant on the subject, we are hardly better off now than formerly. A satisfactory knowledge of art will still be found only among those who practise it, and with a few earnest lovers of it, such as have at all times assisted by their enthusiasm."

Turning over the pages of Sir John Tyrwhitt's "Christian Art," I find the following:—"If we took a man out of Sheffield and educated him for years as an artist at Florence, he probably would not like Sheffield when he had to go back. But we want to teach art in Sheffield. What we are desirous of is that there should be good schools of design, and models of beautiful work and flowers, and still-life, and even means of study from nature in all the great grimy towns on the coal-field." I am aware that one who described himself first as Mr. Tyrwhitt's master and afterwards his pupil, has stated that in the carboniferous formation on which our town is situated there is no home for the artist, no soil in which the delicate root of art can be induced to grow. But I think there is no difficulty in showing that what the author of "Christian Art" is desirous of doing can be done, and done well, if only some of the sons of Sheffield can be induced to give themselves up to steadily using such means as are at their disposal. We all know the importance to the students of science of an accurate and comprehensive knowledge of all that has been done by its pioneers and professors, as a foundation on which to build his own superstructure. This knowledge is equally necessary in art. Many an able man, whose eye had all the feeling, and whose mind the enthusiasm necessary to form an artist, has miserably failed because he knew not the elementary principles of drawing, or was too proud to learn from his predecessors. Reynolds, in his masterly discourse on painting, strongly enforces the necessity of this course. He says:—"Study,

Design 1.

Design 2.

Design 3.

therefore, the great works of the great artists for ever in the order, in the manner, and on the principles which they studied. Study nature attentively, but always with these masters in your company, and consider them as models which you are to imitate, and as rivals with whom you are to contend."

There is no difficulty in carrying out this study in the building in which we are assembled, so far at least as form is concerned. Would you kneel at the highest shrine in lowly admiration of the name which Sir Joshua desired should be the last he should pronounce in his discourse—Michael Angelo—you have in the rooms around you most accurate casts of many of his greatest works. We have the Torso, which he so much admired that it is said when he became blind he used to be led close to it that he might pass his feeble hands over its form. We have the panels by Ghiberti of those gates which he praised so highly that he considered they might well be used as the gates of Paradise. Step into the library and you will find that photography has produced with marvellous exactitude the roll of the master's brush as it passed with lightening rapidity over the ceiling of the Sistine Chapel, and engraving the great architectural monuments with which he adorned Italy's ancient capital. The ornamentation of the Renaissance period has not been neglected, and the Mediæval sculptors who decorated the glorious cathedrals of our own and other lands are now fairly represented On the hill which overlooks the beautiful valley of the Rivelin and the wooded slopes of Wharncliffe, the author of "Modern Painters" has deigned to pitch his tent, and provide for those who wish to study them, examples of the art of Dürer, the early Italians, and the studies of our own great landscape painter, Turner. Should we desire to bend the ductile iron to our will, and to fashion it into those forms of quaint and beautious flower or foliage which ancient and modern artists delighted to produce, we have a rich collection in Mr. Bragge's gift to our Weston Park Museum. Why should not this art be added to our town's productions? Could not the Hallamshire man be taught to wield his hammer as well as the silk weaver of Coventry or the gunsmith of Birmingham? Do we desire to apply Sir Joshua's advice, "Study nature attentively"? Have we not the Ribbledin and Wyming Brook, on whose banks Ebenezer Elliot composed his choicest poetry? The grandeur of our moor-lands with their fine escarpments of millstone grit, the mediæval remains of Conisborough, or Roche Abbey are all subjects which are surely not mean ones for the landscape painter. The brilliant effects of light and shade with some of our manufacturing processes are not beneath the pursuit of an artist; and we fancy that had that king of shadows (Rembrandt) lived at Sheffield he would have been a frequent visitor at the "Cyclops," or the "Atlas," and have etched many a record of their mighty fires. To those of you who are only commencing to tread the paths of art, I would say, work, embrace every opportunity of study that presents itself, and though you may never win a prize, never have your name enrolled among the great ones, you will have a rich reward in the trained eye and mind, with which you can drink in the beauties of the Greek Theseus, or the mases of the great Michael Angelo, you will learn to understand the grandeur of Turner; and last, but certainly not least, you will gaze on the flowers of the garden, the grass of the field, the gem of the mine, with fresh interest; and as you see the setting sun paint the clouds with crimson and gold, you will be fain to exclaim with the great word-painters of Israel, "How manifold are Thy works, in wisdom hast Thou made them all, the earth is full of Thy goodness."

Science and Art Department.

The Committee of Council on Education at South Kensington, have issued their twenty-eighth annual report which contains the following summary of the year's work:—The number of persons who have during the year 1880 attended the schools and classes of science and art in connection with the departments is as follows—namely, 60,871 attending science schools and classes in 1880, as against 59,519 in 1879; and 837,308 receiving instruction in art, showing an increase upon the previous year of 41,864. The total number of persons who received direct instruction as students or by means of lectures in connection with the Science and Art Department in 1880 is 906,171, showing an increase as compared with the number in the previous year of 44,150, or more than 5 per cent. The attendance at the Art and Educational Libraries at South Kensington and at the National Library of Ireland in 1880 has been 84,184, a decided increase over that of last year. The museums and collections under the superintendence of the department in London, Dublin, and Edinburgh were last year visited by 2,332,443 persons, showing a decrease of 167,321 on the number in 1879. It should, however, be observed that the number of visitors to the South Kensington Museum shows a large increase, the number being for 1879 879,395, and for 1880 981,963. The returns received of the number of visitors at the local art and industrial exhibitions to which objects were contributed from the South Kensington Museum show an attendance of 696,541. The total number of persons who during the year 1880 attended the different institutions and exhibitions in connection with the department has been upwards of 3,935,155. This total, compared with that of the previous year, represents a decrease of 8,552 The expenditure of the department during the financial year 1880-1, exclusive of the vote for the Geological Survey, which was £21,717 12s. 11d., amounted to £312,963 17s. 10d.

Prizes for Designs.

The prizes offered by the Plasterer's Company in connection with the Science and Art Department, South Kensington, have been awarded as follows:—For an original design in Monochrome for one bay of a Music-room in a country gentleman's house. First prize (£8 8s) G. W. Shephard, Coalbrookdale School of Art. Second prize (£4 4s.) A. Hall, Cirencester School of Art. For an original design modelled in plaster, for a panel, suitable for the hall of a country seat. First prize (£7 7s.) W. Allen, Royal Architectural Museum School of Art, Westminster. Second prize (£4) A. Rooke, Brighton School of Art.

Manchester School of Art.

The assistant master of Dundee School of Art, Mr. Alexander G. Grubb, has been appointed Second Master of the Manchester School of Art at a salary of £250 per annum.

The Autumn Exhibition at Manchester.

At this exhibition, in addition to works lately hung in London exhibitions, the "Types of Beauty" and other pictures and sketches, the property of the proprietors of the Graphic Gallery will be shown. Among the portraits is one by Mr. Holman Hunt of Mr. Stephen Lushington.

MONTHLY TRADE REPORTS.

Wool.

(From Perkins and Robinson's Circular.)

The feeling of depression that has for some little time been existing in our wool market has found no relief during the past month, but, if anything, has lately become more enhanced, owing to the exceedingly wet weather, which is seriously damaging the crops, combined with a further tendency to dearer money. In the market for home-grown wools, prices have further slightly receded; staplers are now said to be very firm, not being able to replace their stocks in the country districts. Nevertheless, purchasers are very reluctant to operate, and apparently have not much confidence in the present low values. The healthy and moderately active state of the manufacturers generally is the most encouraging feature we have at present.

The Australian wool sales opened in London on the 23rd ultimo before a fair attendance of buyers and with good competition. The total quantity available is 383,000 bales; with the exception of a fall of ½d. to 1d. per lb. in cross-breds, and ¼d. per lb. in Capes and inferior Australians, last sales' closing prices are maintained, more especially for the best wools.

The business here for the past month comprises 1300 ballots Peruvian at late values with a hardening tendency, a few greasy white Lima at 9¾d. per lb., black, 7½d. per lb., 146 bales greasy Monte Video at 8d. to 8¾d. per lb., 40 bags black Spanish, at 6¾d. to 7d. per lb., 93 bales washed Mogadore at 11¼d. per lb. for good fleece, 10d. to 10½d. per lb. for ordinary, and 8½ per lb. for pieces, 11½d per lb. has since been declined for a quantity of good

fleece. In coarse wools, with the exception of 150 bags Oporto yellow, lambs, cotts, and black, and some Castel Branco, all at full prices. also about 100 bales Bed at 3½d. to 3⅞d. per lb. for white and 1¾d. per lb. for grey, scarcely anything has been done.

Alpaca continues in moderatc demand with a slight improvement in prices ranging from ½d. to 1d. per lb. The sales are 1983 ballots at 16d. per lb. for fair average, and 14d. to 14¾ per lb. for middling and strong Arequipa, 13d. per lb. for fine, and 14¾d. per lb. for very superior Tacna; also 11¾d. to 12¼d. per lb. for Chala.

Mohair remained steady during most part of the month at 1s. 8½d. per lb., but in the last week 1s. 9d per lb. has been unexpectedly made for a fair quantity. Thc sales are 662 bags.

Edinburgh and Glasgow Wool Sales.

(From J. and W. Greig's Circular.)

The month of August has been characterised by dulness and want of spirit in the Scotch wool trade. At the Edinburgh sales, held in the second week, there was less anxiety on the part of buyers to invest in parcels of new wool than is usually shown at this season. Similar indifference manifested itself at the Glasgow sale on 24th, when the quantity on show was over the average, and, in consequence a considerable number of lots had to be withdrawn. Prices of all classes have shown a tendency to soften, and there is a disposition on the part of holders to make sales where a slight concession will suffice. At the same time there is no undue pressure to quit stocks in the meantime, until the result of the harvest can be more definitely ascertained. Half-bred and cross wools are in moderate request. White Cheviots are more wanted, and a considerable quantity has taken up. Laid is again neglected. Black-faced white has met with a considerable demand, but laid is comparatively unasked for.

	Washed.			Unwashed.		
	s. d.		s. d.	s. d.		s. d.
Half-bred Hoggs,.....	0 11½	to	1 0½	.. 0 9	to	0 9½
Ditto Wedders,.....	0 11	to	0 11½	.. 0 8½	to	0 9
White Cheviot Hoggs,.....	1 0	to	1 2	.. 0 9	to	0 9¾
Ditto Wedders,.....	0 10½	to	1 0	.. 0 8¾	to	0 9¼
Cross-bred Hoggs.....	0 11	to	0 11½	.. 0 8½	to	0 9
Ditto Wedders,.....	0 9½	to	0 10	.. 0 7½	to	0 8½
Laid Cheviot,.....	0 9	to	0 11	.. 0 7	to	0 8½
Black-faced White.....	0 7	to	0 8	.. 0 5¾	to	0 6¾
Ditto Laid,.....	—	to	—	.. 0 4½	to	0 5

Halifax and Bradford.

Woollens: There has been some improvement during the month. Manufacturers are keeping their machinery well employed without working into stock. Cotton: The past month has been one of disappointment to spinners. In Manchester prices, especially for 2-40's, have ruled very low, and show no signs of improvement. Bradford has also been very quiet, and any orders placed are of a retail nature. Pieces: On the whole, manufacturers are as well employed as they were a month ago, and they are still sanguine of better orders for the coming season, especially if the weather should conduce to the safe ingathering of the crops. There is more evidence that lustre goods will be in increasing demand for the spring. There are fair inquiries for China, and the lowness of prices may lead to buying.

Manchester.

Business during the past month has been very dull, in fact, such a period of inactivity in the market, has not been noticed for some time. No great stocks have accumulated, owing to the fact, that many contracts were made in June, which manufacturers have during August been delivering. By this time the engagements have become much reduced, but in some departments they are yet extensive; however they have so far run out, that there appears a great desire to sell, although the number of sellers has not been great, they have been numerous enough to bring about a fall in prices. Buyers of goods have been well aware of the fact, that the cause of the greater part of this discouraging state of things, has been due to speculative manœuvring which as a natural consequence has greatly restricted business.

Kidderminster.

Business during August has been in an unsatisfactory condition. At the commencement of the month strenuous efforts were made by manufacturers to prevent accumulation of stocks. There was some talk of one firm allowing half their looms to lie idle, rather than manufacture goods unprofitably. The German tariffs give makers of carpets much anxiety, so much is the protection in favour of the Germans, that they can afford to sell Brussels Carpets at 1s per yard under many of the English manufacturers. Then, we suppose the French tariffs will likewise speedily commence to injure the exports from this country, (although these are chiefly Tapestry Carpets that are exported from Kidderminster,) should anything like the new treaty be carried out as proposed, the effect upon this trade will be very serious Many firms are still running short time, but yet there is a growing feeling in the trade, that the operatives, are getting the better part of the profits, and unless some improvement is speedily apparent in trade, weavers must submit to a general reduction in wages.

Nottingham.

There has not been much alteration in the condition of the lace trade during the past month. Silk goods have been rather slow of sale. The demand for Spanish articles has diminished considerably, and there is not much doing in silk, chantilly, and blonde laces. Some kinds of silk nets are however in demand. In the cotton department, laces and trimmings have been selling freely Various styles of millinery goods have been in request, and an active demand has prevailed for common Valenciennes and Lisle laces. Superior qualities of plain net have been inquired for, and have made firm prices; while inferior descriptions have been dull of sale and low in value. Quiltings have been neglected. Curtains are and have been pretty well employed. Ruchings and frillings have sold fairly well.

ORIGINAL DESIGNS.

Our first plate represents a design suitable for Tapestry to be worked in four colours; one of which is to be shuttled. The ground should be Black; the Palm and other leaves Sage Green, the large flowers various shades such as Blue and Crimson, and the smaller flowers Chrome. The whole of the colours to be of pale shades. The shuttling of this design gives great scope for shading the Palm and other leaves with gold and with the various colours used for the flowers, whilst the flowers themselves should be shaded with Gold and Sage.

* * * *

Our second plate is a design equally well adapted for Cretonne as Tapestry. The colouring of this pattern might be as follows:—

The ground a deep Blue, the Ferns of a rich Brown, the leaves Sage Green with edges and veins of Gold, the Fuschias Scarlet and Gold and the Daisies White and Gold.

* * * *

The third plate is also a design suitable for Tapestry, and is equally well adapted for Cretonne. As to the colouring, we should suggest for the ground, a very deep Maroon, the *Ornament* to be in Orange, freely shaded with Citron and Olive; the flowers (which are adapted for shuttling) should be in various light colours, shaded with Orange and Citron; the leaves Olive Green with veins of Citron. The Orange used in this pattern should be of a very deep shade, composed of King's Yellow and Burnt Sienna.

* * * *

In our next issue we hope to present to our subscribers, three full page litho plates of designs; the first for a Table-cover; the second a Carpet with border, and the third a Tapestry fabric.

The Earl of Bradford has consented to open the Fine Art Exhibition, in aid of the funds of the new Infirmary at Bolton, early this month In addition to paintings, there will be a rich collection of bronzes, art pottery, ancient armour, and other interesting objects, including six cases of specimens of industrial art from South Kensington Museum The exhibition will be open about two months.

The Cotton Mills at Krahnholm in Baltic Russia.

We present to our readers an extract from a letter written at Riga, giving a graphic description of the Cotton Mills at Krähnholm, in Baltic Russia :—

The establishment at Krähnholm is a cotton spinning and weaving mill, and is or will soon become the largest in the world. It was founded in 1856, at a cost already exceeding one million sterling, by L. Knoop, of Bremen, a man whose name exercises quite a talismanic sway throughout commercial and industrial Russia. The moving force, all supplied by water, acts through three enormous vertical turbines, each of 1,080-horse power, besides other smaller turbines, and an old fashioned horizontal wheel, altogether raising the strength of the moving engines to 5,100-horse power. The turbines and all the appurtenances were made in Augsburg; the spinning and weaving machines are from Manchester, and exhibit all the skill of the most recent contrivances and improvements. The mill consumes 40,000 bales, or 7,562 tons of cotton yearly; it produced last year 6,518 tons of yarn, and 609,796 pieces, or 1,998 tons of various tissues. In 1875 it employed 3,939 hands; their number is now 4,827. The mill consists of two great buildings, four stories high, with considerable out-houses, to which yearly additions are made. It yields, I was told, though to me it seems hardly credible, an interest of 50 per cent. on the capital invested.

From the manufactory, at Krähnholm we proceeded to view two other establishments—a woollen-cloth and a flax mill—both situated on the Esthonian bank of the river, and both founded by Baron Hieglitz, now sold to a joint-stock company; the first supplying excellent cloth for the officers of the Russian army, the other producing the best sail-cloth, for which there is a large demand in the country and abroad. Both these factories are older, and fall short of the order and cleanliness that reigns at Krähnholm; but I must confess that the result of such enterprises, wherever I see them, interest me less than the means by which they are obtained. What I am anxious to learn is, how much these or similar establishments contribute to solve the great question of the mutual relations between capital and labour; or, in other words, what is done by the millowners towards the health, contentment, and improvement of their working people. For there is no doubt in my mind that there must for ever be hard work to be done in this world; that labour will always be dependent on capital; and that if in many flagrant cases capital abuses the power that its position gives it, it is rather to gross ignorance than to actual inhumanity that the evil is owing. It seems to me that, apart from all philanthropic considerations, it ought to be for a millowner's self-interest to do his best for his operatives; to have at least as much charity and consideration as a wise husbandman has for his dumb cattle; because the dealing with mere brutes is so different in various countries—in England, for instance, from what it is in Spain, brutality amongst these latter people arising from sheer stupidity rather than from want of kindheartedness—that it is worth inquiring how far working men in different mills meet, not only with a loving disposition, but also with at least common intelligence on the part of their employers.

In this respect I must say that I have nowhere seen better management than I found in Russia in the Krähnholm manufactory; but it is right to add that although Narva is Russian ground, the Krahnholm mill owes its origin to a German, a man gifted with brain as well as with a heart, and that although the workmen are either Russians or native Esths, the men trusted with their guidance and governance are all German, French, or English, and appointed by one who knows where and how to choose them

The mill, as we have seen, has nearly 5,000 men, women and children—the latter never less than 12 years old—in its pay. It is a little community in itself, its grounds spreading over several scores of acres, the workmen's habitations clustering in scattered colonies around, constituting as many villages, where families may live jointly or in separate cottages at pleasure. With respect to bath and wash houses, to warming and cooking apparatus, flower and kitchen gardens, schools, libraries and reading rooms, hospitals and infant homes, and whatever else may insure comfort and convenience, all has been contrived with a minute and patient attention which I have never seen equalled, the principle upon which the establishment is grounded being perfect freedom. The operative is at liberty to take or leave what the owner supplies; the men receive their wages in cash, and provide for themselves; they can have wholesome and pleasant habitations at very moderate rents within the grounds, or live in the town and elsewhere at their choice, the company encouraging them to keep co-operative stores among themselves, to protect them from the extortions and adulterations of the tradespeople. The average monthly wages are 14 paper roubles (the rouble about 2s.) for a spinner and 16 roubles for a weaver; but, we are told, "a good spinner may earn as much as 35 roubles a month, and a good weaver 30 roubles." The mill opens at 5 o'clock in the morning and closes at eight in the evening, with allowance of half an hour for breakfast and 1½ for dinner. The working hours are furthermore shortened by two hours on Saturday evening. On Sunday the mill, of course, remains closed. The task is too heavy, in my opinion, though the long summer day affords still many hours for recreation and instruction, and in the winter season the workmen would scarcely know how to dispose of the leisure hours of the endless night.

Altogether, the establishment made upon me the impression of a happy family. The workmen though different in race and language, live together in peace and unity, exhibiting all outward signs of docility and intelligence, cheerfulness and contentment. As a proof of their sober, thrifty, and provident habits, I need but state that the total sum of the deposits at the savings bank, which only amounted to 62,955 roubles in 1875, and 88,654 in 1876, has risen this year to 205,220 roubles.

(*By permission of Editor of "The Times."*

ODDS AND ENDS.

A second Suez Canal under English auspices is projected, and is the subject of animated discussion in the Alexandria press. The advantages proposed include a quicker transit and a reduced tariff.

* * * *

Increased facilities will be shortly given for the transmission of money through the post, if, as we understand is probable, Mr. Fawcett should decide to carry out an insurance scheme which he has had under consideration for some little time. Under this scheme the public will be enabled to send money between places in the United Kingdom with absolute immunity from loss, and with practically as little trouble to themselves as is now involved in the making up and posting of a registered letter. The maximum amount insurable is not yet settled, and is, we believe, one of the principal points under consideration.

* * * *

Mr. A. F. Stoddart, the senior partner in the well-known firm of Stoddart and Co., Glenpatrick Carpet Mills, near Paisley, Scotland, has lately handed over to the inhabitants of the village of Elderslie, where his workpeople reside a handsome Village Hall, comprising a spacious lecture room, a reading room and well stocked library, a billiard room, and another recreation room for chess, draughts, and "curling," and rooms for the residence of a care-taker. The site was given by the trustees of the old school, now superseded by a Board School, and the cost of the building amounting to £2,000, was defrayed by Mr A. F. Stoddart. The inaugural proceedings took the form of a tea meeting, the expense of which was also defrayed by the donor of the Village Hall. Mr. Stoddart in his address referred to the stuffy little weaving shed with its twenty-four looms, which many of the workpeople could remember, and contrasted it with the present shed, where about 120 looms are beating time to the music of good wages and steady pay. To such an extent had the work expanded that the hands of the firm were seldom out of the mortar tub. The whole of the opening proceedings were of an interesting and enthusiastic nature, and many other benevolent acts of Mr. A. F. Stoddart were gratefully referred to.

Messrs. Treloar & Sons, of 69, Ludgate Hill (City,) have lately opened new premises as a carpet warehouse, opposite to their present establishment.

* * * *

Negotiations are proceeding between the Dutch and French Governments for the conclusion of a New Treaty of Commerce, after a short prolongation of the existing treaty.

* * * *

The negotiations for the new Franco-Italian Treaty, which were to be resumed in Paris on the 25th ultimo, have been postponed for a short time, at the request of the Italian Government.

* * * *

A scheme for the extension of railway communication in and about Liverpool has been devised by one of the leading railway companies having connections with that city. Its main feature is the construction of a network of under-ground lines, for both passengers and goods.

* * * *

Replying to a correspondent in Pontypridd, Mr. Fawcett, M.P., states that he is about to make an inquiry at once as to the advisableness of abolishing the embarrasing distinction on receiving letter boxes. The question of abolishing telegraph stamps has, he adds, been for some time under his consideration, but he has not yet been able to arrive at any decision upon it.

* * * *

At a meeting at Coventry a few days ago, with respect to foreign tariffs, it was resolved "That they were destroying the commerce of this country, and obliging English workmen to emigrate by thousands to foreign lands. The Government was called on not to negotiate any treaty with France or other countries except on purely Fair Trade principles."

* * * *

The self-actor minders employed in Mossley, at the Queen Street Mills, Messrs. George Mayall and Co., and the Old Side at Carr Hill Mills, Messrs. Nathaniel Buckley and Sons, have struck work for an advance in their wages, on account of the unprofitable nature of the work they are engaged upon. Some 700 or 800 people are thrown out of employment through the dispute.

* * * *

A correspondent of the *China Mail* gives a very unfavourable account of affairs of the Chinese woollen factory at Lanchow-fu in Kansu, which he visited a short time ago. He ascertained that the wool, which is too coarse for most purposes is piled on the ground floor to rot: that only 20 per cent. of it is fit to make coarse flannel, 30 per cent. railway rugs, and that 50 per cent is waste and full of straws. He found "the honest and intelligent foreign director at work frilling cloth; the dirtiest operation in the factory, which ought to be managed by a separate instructor, is thus left to the chief." His orders or directions have been ignored in a most inexplicable manner. The apprentices, though willing and obedient, are very stupid, yet it is expected they will learn in a few months what it takes years to learn by intelligent foreigners.

* * * *

At a meeting recently held in Exeter Hall to consider the question of "foreign tariffs"—Sir Algernon Borthwick in the chair—the following resolution was carried unanimously:—"That this meeting protests against the iniquitous system of 'foreign State bounties,' which is paralyzing British labour and British industries, and, while regarding with surprise and indignation the conduct of Her Majesty's Government, demands, as a matter of right and justice, that Parliament should impose such revenue duties as will intercept the bounties and enable British manufacturers and workmen to compete on a fair footing with foreigners in British home markets." A second resolution, which was also carried, was as follows:—"That this meeting, regarding with grave apprehension the present condition of British commerce and labour owing to the operation of foreign protective tariffs, declares that the interests of the country demand the imposition of such revenue duties on foreign products as will allow British subjects to compete on a footing of equality with those of foreign nations at home and abroad."

NOTICE TO ADVERTISERS.

Situations Vacant and Wanted.

The Publishers wish to call the attention of Manufacturers, Designers, and all others interested in the production of Textile Fabrics, to this department, which they are anxious to make a special feature of the Journal.

Advertisements will be inserted at the following rates; (in all cases prepaid):—*Twenty words, One Shilling; Sixpence* for each additional *Twelve words* or part of *Twelve.* The address being counted as part of the advertisement.

Full page or displayed advertisements according to arrangement.

JACQUARD DESIGNER.—A Designer of White Quilts, Alhambras, Honey Combs, Toilet-covers, &c., is open for an engagement, either with a Manufacturer or Public Designer. First-class references. Address A.B., *Journal of Fabrics* Office, 3, Gerrard Street, Halifax.

DESIGNER, at present with a firm, manufacturing Tapestry, Silk, and Muslin Curtains, &c., is open for an engagement. Several years experience in Tapestry, Silk, and Cotton Goods; would go abroad. Address C.E., *Journal of Fabrics* Office, 3, Gerrard Street, Halifax.

THE GAZETTE.

Adjudications of Bankruptcy.

Reid, James Cross, Nelson Street and Southbrook Terrace, Bradford, commission agent.

Liquidations by Arrangement or Composition.

Bedford, Joseph, Violet Street, Halifax.
Bennett, John Robert, trading as R. G. Smith Bennett, Lorne Terrace, Green Lanes, Stoke Newington, trimming makers
Brearley, William, and John Sutcliffe, Bath Parade Works, Halifax, dyers.
Hewitt, Eli, trading as Hewitt and Son, Manor Place, Holloway Road, London, shirt manufacturer and hosier.
Radcliffe, Jabez, King Cross Street, Halifax, wool and waste dealer.
Riley, Richard, Higher Walton, near Preston, floor-cloth maker.
Threappleton, Joseph Paget, West Street, Paddock, Huddersfield, yarn spinner.
Lister, George, Castle Mill, Keighley, stuff and angola manufacturer.
Storey, James, Red Lion Street, Manchester, shirt manufacturer.
Ogden, T., and Lumb, W., Mytholmroyd, Yorks., worsted spinners.
Perkins, Henry, Prospect Mill, Birstal, near Leeds, felt manufacturer and spinner.
Simpson, James Rowland, Idle Lane, Bolton, late cotton cloth maker.
Stubbs, George Andrews, Coten End, Warwickshire, artist, designer, and decorative tile maker.
Wiley, A. J., and E. Rowley, Huddersfield, woollen manufacturers.
Kuenemann, Robert Anthony, junior, Kennedy Street, Manchester, calico printer.
Thistlethwaite, Wm., Bermondsey, Bradford, wool-broker, noil and top merchant.
Reavy and Norbury, Sackville Street, Chorlton-on-Medlock, Manchester, finishers.
Lord, S., Liverpool, cotton broker.
Williams, T. B., Rochdale, flannel manufacturer.
Quambush, J. W., Leeds, wool merchant.
White, G., Bingley, stuff manufacturer.
Hawgood, H., upholsterer, 64, 66, and 282, Fulham Road, London.

Sequestrations.

Storie, J. and Son, and James and James Gillespie Storie, the partners and as individuals, 1, India Buildings, Edinburgh, commission merchants.
Hutchinson and Gray, Dundee, spinners.

Trustees Appointed.

Balaban, Jacob (Bankrupt) Manchester, commission agent. Trustee, J. Stott, 3, Booth Street, Manchester, accountant.

Parsons, Thomas H., Henry Wright and James Henry Smith. (Bankrupts) Liverpool, shirt makers. Trustee, G. Mahon, 26, North John Street, Liverpool, accountant.

Phillips, John Dennis and Charles A. Hamilton, trading as J. D. Phillips and Co., (Bankrupts) Tithebarn Street, Liverpool, cotton brokers. Trustee, T. Bellringer, Government Buildings, Victoria Street, Liverpool, registrar.

Walsh, John and Richard Ducket (Liqnidation) trading as Walsh Brothers, Old Hall Street, Liverpool, and Africa, African merchants and shipowners. Trustee, H. D. Eshelly, 24, North John Street, Liverpool, accountant.

Emsley, Matthew H., (Bankrupt) Heckmondwike, rag and shoddy merchant. Trustee, J. Bowden, Eccles, accountant.

Garside, Joshua (Liquidation) West Vale, Halifax, shoddy dealer. Trustee, F. Foster, Halifax, acconntant.

Henderson, A. (Liquidation) Upholsterer, Nottingham. Trustees, Hardy and Leman, Nottingham, accountants.

Dividends.

Johnson, Frederick (Liquidation) Lower Walton, Cheshire, commission agent; 1st and final dividend, 1s. J. Mainwaring, Old Post Office Buildings, Sankey Street, Warrington

Coakley, Joseph and William Jackson, trading as Store Street Doubling Co., (Liquidation) Jnnction Street, Manchester; 1st dividend, 3s. J. T. Kallas-Johnstone, Kennedy Street, Manchester, accountant.

Feather, N. B., and J. Hudson (Bankrupts.) Bingley, worsted spinners; second and final dividend, 2s. 10d. J. Whiteley, 1, Scott Street, Bingley.

Hargreaves, G. (Bankrupt.) Shipley, Yorks., worsted manufacturer; first and final dividend, 6s. 9d. J. C. Wright, Darley Street, Bradford.

Bills of Sale.

Burton, Wilson, 57, Southampton Street, Camberwell, mantle manufacturer, for £8, to Henry Marcussen.

Mills, John, 102, Ramsden Road, Balham, and 47, Knight Rider Street, City, mantle manufacturer, for £28, to the Union Advance Co.

Renshaw, S., 22, Claremont Street, Beech, Sowerby Bridge, Yorks., cotton spinner, for £12, to Gledhill Hallas.

Walker, O, White Lee Goal, near Batley, Yorks., blanket raiser, for £17, to Lincolnshire Advance Bank.

Baldwin, J. O., Mount Villa Dore, Derbyshire, commission agent, for £51 7s. 9d., to Robert McCurrey.

Cryer, Joseph Eli, Edward Cryer, William Cryer, of Dukinfield Mill, Dukinfield, Cheshire, cotton spinners, mortgage to G. B. Cuff.

Anderson, J., 12, York Street, Queensbury, Yorks., machine wool comber, for £6 5s., to Liverpool Investment Co.

Crabtree, W., Lee Street, Thornton Road, and 204 Ripon Street, Bradford, wool and waste dealer, for £120, to Henry Crabtree.

Raven, W. J., 8, School Street, New Lenton, Nottingham, designer, for £35, to Aaron J. Jacobs and another.

Perrott, W., 12, Clydesdale Road, Colville Square, Bayswater, upholsterer for £21 to Charing Cross Bank.

Southwell, H., Ramsay Street, Rochdale, bobbin maker, for £110 to Albion Loan Company.

Wragg, W. C., Allcroft Terrace, Chilwell Road, Beeston, Notts, designer, for £14 to H. M. Beirnstein.

Dissolution of Partnerships.

Duke, J. H. and T., trading as Thomas Duke, Lurgan, handkerchief manufacturers.

Hay, P. and K., Leith Walk, Edinburgh, dyers, business continued by T. Henderson, under same firm.

Porteous, J. and W. and Co., 8, South Frederick Street, Glasgow, commission agents.

Webster and Turnbull, Argyle Street, Glasgow, clothing manufacturers, as regards Webster. Debts by remaining partner.

Love, Austin and Co., Belfast and Manchester, linen manufacturers, &c. Debts by John Love.

Simpson and Higgin, Deans Mill, Swinton, cotton spinners.

White, C. R. and E. White, trading as J. White and Sons, Bradford, waste dealers.

Merrifield, E. J. Milligan and J. H. Ziegler, trading as Merrifield, Milligan and Co., Liverpool and New York, cotton commission merchants, as regards J. Milligan.

Millar, A., T. B. Miller and A. M. Torrance, trading as Miller, Son and Torrance, London, Glasgow, and Belfast, muslin warehousemen, as regards A. Millar.

Caldecott, A. and E, Cheapside, city warehousemen.

Furstenhagen and H. Wildt, Bradford, yarn agents.

Ronald, J. G. and H. L. Taylor, Jun., St. Stephen's Chambers, Telegraph Street, City, wool-brokers.

Applications for Letters Patent.

3316. John Johnson Broadbent and Edward Mitchell, Bradford, "Improvements in apparatus for spinning, roving, and twisting fibrous substances."

3321. Joseph Holding and Edward Kenworthy, Dntton, Manchester, "Improvements in and in connection with loom pickers, and in the manntacture thereof."

3323. Charles Herbert Openshaw, Bury, "Improvements in the method of and means for mounting the spindles of spinning machinery."

3345. Robert Millar, Paisley, "Improvements in the manufacture of shawls."

3348. Luke Smethurst, Stainland, near Halifax, "Improvements in machinery for pressing and finishing textile fabrics, and in the manufacture of paper therefor."

3398. George Peter Leigh, Manchester, "Improvements in the construction of machines known as slubbing, intermediate, and roving frames, used in the preparation of cotton and other fibrous snbstances for spinning."

3433. Austin Hugot, Paris, temporarily of Chancery Lane, "Improved apparatus for supplying lubricants to friction surfaces."

9460. Joseph Heaton, of Bradford, "Improvements in machinery for combing wool and other fibres."

3503. James Seed, Preston, "Improvements in machinery or apparatus for spinning and doubling cotton and other fibrous substances."—The same is partly his own invention, and partly a communication.

3524. Thomas Sutcliffe, Clough-foot, Todmorden, "Improvements in looms for weaving."

3529. William Robert Lake, London, "Improvements in and relating to the manufacture of fabrics with velvet or pile surfaces."—A commnnication.

3538. James Porritt, Milnsbridge, "Improvements in the method of and apparatus for registering by means of electricity the number of picks woven per inch in looms for weaving.

3553. Gustav Jagenburg, Rydboholm, Sweden, "Improvements in dyeing aniline black on cotton, unspun, spun, woven, or in other condition."

3375. Charles Denton Abel, Chancery Lane, "Improvements in bleaching linen and hemp threads and tissues."—A communication.

3598. Edwin Smith, Honley, near Huddersfield, "Improvements in looms for weaving."

3603. John Henry Johnson, 47, Lincoln's Inn Fields, "Improvements in preparing colouring matter, suitable for dyeing and printing."—A communication.

3607. Alfred Hitchon, Accrington, "Improvements in apparatus for marking and indicating the length of yarn on weavers beams."

3610. Henry Moses Mellor, Nottingham, "Improvements in the manufacture of circular ribbed fabrics, and in circular hosiery frames to be used for this purpose."

3612. Philip Dunkerley, Manchester, "Improvements in weaving."

3625. Isaiah Wallwork and Abel Wallwork, Ashton-under-Lyne, "Improvements in pickers and picker-spindles, and in the method of lubricating the same, partly applicable to other spindles and axles, and to bearings."

3673. James Walton, Collyhurst, "Improvements in apparatus for singeing fabrics."

3718. Justus Wolf, Manchester, "Improvements in sizing, mordanting, dyeing, printing, and finishing textile and other materials, and in apparatus connected therewith, partly applicable to other purposes.

3728. Frederick Caldwell, Loughborough, "Improvements in machinery and apparatus to be employed in the manufacture of knitted fabrics."

3528. Edward Hagen, Ealing, "Improvements in the production of ozone on a commercial scale for bleaching and other purposes, and in apparatus connected therewith."—A commnnication.

3730. James Barbour and Abram Combe, Belfast, "Improvements in machinery for spinning or twisting coarse yarns."

3735. Frederick Ripley and Thomas Hargreaves Brigg, both of Bradford, "Improvements in spinning machinery."

3743. Jonathan Northrop, Embsay, near Skipton, "Improvements in looms for weaving, and in apparatus connected therewith."

3758. John Fox, Milton Street, London, "New or improved machinery or apparatus for 'cutting out' textile and other fabrics.

Grants of Provisional Protection for Six Months.

2584. Herbert John Haddan, 67, Strand, "Improved coverings for rollers used in spinning machinery."—A communication.

2736. John Baldwin, William Baldwin, Robert Haddon, and James Crossley Dyson, all of Halifax, "Improvements in machinery for combing wool and other fibrous substances."

2856. Lorentz Albert Groth, Proprietor of the Scandinavian Patent Office, "Improvements in spindles for doubling machines."—A communication.

2972. William Atherton, Preston, "Improvements in looms for weaving."

3066. Henry Robinson, Bolton, "Improvements in mules for spinning and doubling cotton and other fibrous materials."

3080. John Clayton and Thomas Richmond, both of Burnley, "Improvements in looms for weaving."

3092. Frederick Craven, Brighouse, "Improvements in tentering and drying machines."

3097. Ernest de Pass, 68, Fleet Street, "An improved machine for sorting, beating, and breaking the waste of wool, cotton, and like materials."—A communication.

3128. Thomas Singleton, Darwen, "Improvements in looms for weaving."

3132. John Horrocks and James Horrocks, Manchester, "Improvements in machinery for doubling and winding, and for doubling, winding, and twisting fibrous materials."

3144. Charles Frederick Burslem and Edward Burslem, both of Cheadle, "Improvements in the manufacture of pickers for looms."

3176. Edward Crossley, Giulio Marchetti, Carpet Manufacturers, Richard Cochrane, and William Mallinson, all of Halifax, "Improvements in the manufacture of Brussels, terry, pile, or other carpets."

3208. James Higgins, Salford, and Thomas Schofield Whitworth of the same place, "Improvements in machinery or apparatus for preparing cotton and other fibrous materials for spinning."

3220. Charles Timothy Bradbury, Buckton, and Richard Henry Harrison, Dunkinfield, "Improvements in looms for weaving."

3221. James Worrall, Ordsall, Salford, and John Kershaw, Wadsworth, Halifax, "Improved apparatus applicable to the scouring, dyeing, and washing of pile fabrics."

3222. Robert Frederick Carey, William Henry Carey, and William Partington, all of Bulwell, "Improved apparatus for drying fabrics at tension."
3233. Thomas Coulthard, Preston, "Improvements in machinery or apparatus for spinning and doubling cotton and other fibrous materials."
3237. James Robinson Hancock, Nottingham, "Improvements in bobbin-net, or twist lace-machines, and apparatus applicable thereto."
3257. Charles Denton Abel, Chancery Lane, "Improvements in treating or finishing gauze, bobbin-net, tulle, and such like textile fabrics, and in apparatus therefor."—A communication.
3244. William Dean and Arthur Orrah, Huddersfield, "Improvements in the manufacture of cords and other like pile fabrics."
3398. George Peter Leigh, Manchester, "Improvements in the construction of machines known as slubbing, intermediate, and roving frames used in the preparation of cotton and other fibrous substances for spinning."
3480. Joseph Heaton. Bradford, "Improvements in machinery for combing wool and other fibres"
3529. William Robert Lake, Southampton Buildings, "Improvements in and relating to the manufacture of fabrics with velvet or pile surfaces."
3325. Charles Denton Abel, Chancery Lane, "Improvements in bleaching linen and hemp threads and tissues.—A communication.

Notices to Proceed.

1668. George Hurst, Nottingham, "Improvements in curtains and valances."
2310. William Mather, Salford, "Improvements in apparatus for bleaching, dyeing, washing, scouring, and soaping cotton, flax, silk and wool, in the unspun condition, after spinning, and in the woven fabric.
1491. Charles Telford Smith, Samuel Milne Milne, and John Harrison Binns, all of Bradford, "Improvements in machinery or apparatus to be employed in the dyeing of fabrics."
1637. Thomas Holliday, Huddersfield, "Improvements in obtaining coloring matters for use in coloring cotton and other textile fibres."
1638. Thomas Holliday, Huddersfield, "Improvements in producing azo colors on cotton or other vegetable fibre."
1521. Joseph Lomax, and Richard Dawson, both of over Darwen, Improvements in shuttles for weaving, parts of which improvements are applicable to other uses.
1612. James Priestley, Frederick Priestley, overlookers, and George Priestley, manufacturer, all of Bradford, "Certain improvements in power looms, and in apparatus connected therewith, for weaving and cutting plush, and velvets, seal skins, and other piled fabrics."
1889. Frederick Moore, Trowbridge, "Improved machinery for removing burrs and spiles from wool."
3221. James Worrall, Ordsall, Salford, and John Kershaw, Wadsworth, Halifax, "Improved apparatus applicable to the scouring, dyeing, and washing of pile fabrics."
1578. John Leadbeater and Alfred Leadbeater, both of Morley, "Improvements in the method of and apparatus for feeding wool and other fibres to scribbling and carding machinery."
1634. William Morgan-Brown, Southampton Buildings, "Improvements in looms for weaving tufted fabrics chiefly used for carpets, rugs, and articles of that kind."—A communication.
1811. William Robert Lake, Southampton Buildings, "An improved process or method of treating vegetable textile materials, chiefly designed to facilitate the dyeing of the same."—A communication.
2952. Lorentz Albert Groth, Proprietor of the Scandinavian Patent Office, "New or improved process for preparing textile meterials with chemical solutions of silk, wool, or feather down or mixtures thereof."—A communication.
1689. John Erskine, Strabane, Ireland, "An improvement in spinning and twisting frames."
2055. Edward Wilson, Preston, "Improvements in looms for weaving."—
2269. Elijah Smith, Isaac Cuttler, and William Shaw, of Bradford, "Improvements in spinning and twisting apparatus."
3127. Arthur Greenwood, Leeds, "Improvements in silk-dressing machinery."—A communication.
3208. James Higgins, Salford, and Thomas Schofield Whitworth, of the same place "Improvements in machinery or apparatus for preparing cotton and other fibrous materials for spinning."
2009. John Frederick Harrison, Bradford, "Improvements in machinery for combing wool or other fibres."
1821. Francis Sagar Witham, Nelson, near Burnley, "Improvements in looms for weaving."
1825. George William Clayton, Nutsford Vale, Manchester, "Improvements in the construction of apparatus for 'padding' colors on to calicoes or other woven fabrics."
1987. Thomas Coulthard, Preston, "Improvements in machinery or apparatus for spinning and doubling cotton and other fibrous materials.

Patents on which the Stamp Duty of £50 has been Paid.

3073. Thomas Holliday, Huddersfield, "Improvements in dyeing and printing aniline black."—A communication.
3213. Robinson Scott and Joseph Hanson, both of Halifax, "Improvements in machinery for combing wool and other fibres."
3044. John Clayton and Dan Clayton, Bradford, "Improvements in shuttles employed in looms for weaving."
3165. William Terry and John Scott, Dudley Hill, "Improvements in machinery or apparatus for combing wool and other fibrous substances."
3327. Samuel Cunliffe Lister, Bradford, and Jose Reixach y Gispert, Manningham, "Improvements in the manufacture of piled fabrics, and in the machinery or apparatus employed in manufacturing piled and other fabrics.
3457. Isaac Holden, Bradford, "Improvements in apparatus employed in combing wool and other fibres."

Patents on which the Stamp Duty of £100 has been Paid

2796. Henry Walton Whitehead, Holbeck, "Improvements in the drawing off apparatus of gill boxes and carding and balling machinery used in the drawing and carding of wool, flax, tow, silk, cotton, and other fibrous substances."—A communication.
2757. William Ireland, Buckhaven, Fife, "Improvements in printing textile and similar fabrics, and in the machinery or apparatus employed therefor."
2926. Arthur Barraclough, Halifax, "An improvement in woven fabrics, and in the means of producing the same."

Patents Sealed.

520. George Lendrum and Thomas Beardsell, and Sam Mitchell, of the same place, "Improvements in looms for weaving."
522. James Hollingworth, of Dobcross, "Improvements in looms for weaving."
672. Edwin Jackson, Bradford, "Improvements in looms."
2355. Thomas Robinson, Leeds, "Improvements in machinery for doubling, drawing, roving, and spinning woollen wool, cotton, silk, and other fibrous substances."
779. John Pearson Cox, Nottingham, "Improvements in steam presses for the finishing of lace and other manufactured goods where a light finish is required."
2569. Robert Hall, Bury, and James Hobson, "Improvements in looms for weaving."
763. Joseph Buckley and John Camm Buckley, Leeds, "Improvements in apparatus for pressing, smoothing, and finishing garments or parts of garments, also for pressing woollen or other woven or felted fabrics."
1136. William Robert Lake, London, "Improvements in machinery for combing wool and other fibrous material."—A communication.
904. James Hollingworth, Dobcross, "Improvements in looms for weaving."
1011. Abram Combe, Belfast, "Improvements in machinery for spinning or twisting coarse yarns."

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The Associated Chambers of Commerce.

The two days' session of our Commercial Parliament has this year been held on the 4th and 5th inst., at Plymouth, and it seems to have been held under circumstances that rendered the occasion agreeable and pleasant to those who took part in it, whether in relation to the hospitality which the Delegates received, the mode and harmony in which business was transacted generally, or the conditions of the weather. It is 10 years since this peripatetic Council of Commerce assembled at Plymouth before, and the deepest interest seemed to be evinced in its proceedings by the dwellers on the Sound. Comparatively speaking they were not many projects before the Conference bearing on immediate prospective legislation. Whether this was purposely devised or not does not seem quite clear, but it may prove to be fortunate, in so far that there will not be so much disappointment as there might otherwise be in the event of the next Session of the Imperial Parliament proving to be as barren as the last one in measures bearing on the commercial interests of the United Kingdom. It is beyond dispute that the *pièce de rèsistance* of the Session was the motion introduced by the representative for Halifax (Mr. Ormerod) which, although it seemed to be almost impromptu, was treated with as much consideration as the suspension of Standing Orders, and a long and earnest debate could confer upon it, to which was added the weight of a unanimous vote, after the excision of one phrase which demanded the establishment of Free Trade on the part of France at the expiration of the Treaty "that is to be." It would be idle to deny that the passing of this motion is a matter of the deepest importance, coming, as it does, from the united representatives of the country in matters commercial. It will not only strengthen the hands of Government in their negociations, but it will indicate to the Government in unmistakeable terms what the real opinion of the English business world is upon the matter. The motion that evoked the interest of the Associated Chambers next in order of liveliness, if not of importance, was that of Mr Samson Lloyd (Birmingham), who proposed a resolution on behalf of the Birmingham Chamber, the title of which has been designated by some as "Fair *v.* Free Trade." A majority of the meeting went behind the motion, where they saw—or thought they saw—the *pied fendu;* the consequence was that a rider was added to the substance of the motion which led Mr. Lloyd to refuse to accept its paternity. In this form, however, it was put and carried, Mr. Lloyd voting against it. We give below a summary of the various resolutions under their several heads. During the first day's sitting the first motion introduced was on

THE PATENT LAW REFORM.

Mr. Sampson Lloyd proposed a three-fold resolution, viz.: (1) "That it is highly desirable that the existing Patent Laws should be amended;" (2) "That any amendment of them ought to contain provisions compelling patentees to manufacture within the United Kingdom all goods which are the subject of an English patent;" (3) "That the cost of provisional protection should be reduced to a merely nominal sum, say not exceeding 10s., in order to afford facilities to poor inventors." The first portion of this motion was accepted with unanimity; the second with the addition of the words "Or that such patentees should be compelled to license English subjects to work such patents as part of a proper royalty;" and the third with the elimination of the phrase "Say not exceeding 10s." It was further determined to present a petition to Parliament, and a memorial to the Board of Trade, praying that an act be passed in the ensuing Session of Parliament, reforming the Patent Laws, and that the three bills of the Society of Arts, Mr. Anderson, and that of the Government of 1879, be referred to the Council of the Associated Chambers of Commerce.

BILLS OF SALE ACT.

Mr. Lane (Bristol) moved a vote of thanks to the following members of Parliament: The President (Mr. Monk), Mr. Sergeant Simon, Mr. Lewis Fry, and Mr. Barran, "For bringing in their bill of last session on this subject, and for their perseverance with it before the Committee of the House of Commons, and that they be requested to re-introduce it next session, with such necessary modifications as their experience may have satisfied them are necessary." Carried.

LOCAL PARLIAMENTARY ENQUIRIES.

It was unanimously resolved on the motion of Mr. Plummer (Newcastle), that, so far as possible, all local enquiries should be conducted in the district in which the question at issue arose.

"FAIR *v.* FREE TRADE."

Mr. Sampson Lloyd then moved "That the long-continued depression in the productive industries of this country, and the disposition shewn by foreign states to increase import duties, render it highly desirable that the attention of Her Majesty's Government should be directed to the almost unlimited field for the extension of the trade and the employment of the capital of this country offered by the colonies and dependencies of Great Britain; and that our national policy should be directed as far as possible to bring about freedom of trade between the various parts of the empire, and thus, by utilising and developing their resources, enable this country to become more independent of the effects of hostile foreign tariffs." To this was added, on the motion of Mr. Norwood, M.P. and representative of Hull,—"That this chamber takes this opportunity of expressing the opinion that the principle of absolute free trade forms the soundest basis on which to extend and consolidate trade relations between the various parts of the British empire." In this form this compound motion was carried, after a debate somewhat acrimonious in character.

BOUNTIES TO SHIPPING.

It was then resolved "That the French system of bounties to shipping is unfair, and that the Executive Council are therefore requested to make such representations to the Foreign Office as they may seem most advisable." This motion was introduced on the initiation of the Hull chamber.

BILLS OF EXCHANGE BILL.

A committee of observation on the progress of the Bill relating to Exchange Bills, which will be re-introduced in the

next session of Parliament, was moved for and obtained on the motion of Mr. Behrens (Bradford), the motion being seconded by Mr. Fisher (Hull).

THE RAILWAY COMMISSION.

The most successful motion was that on this subject, moved by Mr. Wills (Bristol), and seconded by Mr. Clarke (Wolverhampton), in these terms:—"that this Association views with satisfaction the conclusions arrived at by the Select Committee on Railways, so far as they have at present gone, and especially the third recommendation that a *locus standi* be granted to Chambers of Commerce before the Railway Commission and trusts that the Select Committee will complete its labours next session."

TRADE STATISTICS.

The concluding resolution of this day's sitting was one demanding statistics of trade more reliable than those published by the Board of Trade, and the Board of Customs at present.

The second day's sitting commenced by a motion from Mr. Alexander (Falkirk), on

TELEGRAPHIC COMMUNICATION.

The ultimate form of the resolution arrived at was:—"That the Government be requested to enter into negociations with foreign countries, and our colonies, for the purpose of cheapening and facilitating telegraphic communication."

SAVINGS' BANKS RECEIPTS.

It was moved by Mr. Kayll (Sunderland), and seconded by Colonel Page, "That in the opinion of this Association, it is desirable that *interim* receipts should be issued by the postal authorities, and given to investors on depositing money in the Post Office Savings' Bank for investment in Government Stock, as a protection against fraud; and that the Executive of the Association be requested to take such steps as they deem necessary to accomplish the desired reform." Carried by 34 to 16.

THE PARTNERSHIPS' BILL.

Mr. Behrens next moved "That the Executive Council having been informed that the President of the Board of Trade is unable to take charge during the next Session of Parliament of the Bill on Partnerships, as prepared by this Association, but that he has intimated that Her Majesty's Government would support it if it were again introduced on behalf of the Association, resolved that the President be requested to re-introduce the Bill at the very earliest opportunity in the House of Commons, and to use every means in his power to carry it to a successful issue through both houses." Mr. Baxter (Leeds), seconded this, and it was unanimously carried.

RIVERS' POLLUTION ACT.

It was next resolved, "That it is of great importance, that the purity of our rivers should be maintained, but that in the interests of the manufacturers of this country, it is desirable that the Rivers' Pollution Act of 1876, should be so amended that persons complying with its provisions should not be liable to prosecution at Common Law."

THE LAW OF BANKRUPTCY.

It was resolved, "That, in the opinion of this meeting, the Bankruptcy Bill of the Association is far preferable to the one brought in by the President of the Board of Trade in principle, and the Executive Council are requested to re-introduce it as early as possible."

COMMERCIAL COURTS OF FIRST INSTANCE.

It was affirmed by resolution that it is desirable to constitute some of the most important of the County Courts as Courts of First Instance for all commercial disputes. Mr. Behrens moved, and Mr. Sampson Lloyd seconded this resolution.

MINISTER OF COMMERCE.

A resolution affirming the desirability of the appointment of a Minister of Commerce was then passed.

THE COMMISSION ON TECHNICAL EDUCATION.

A motion of congratulation was next agreed upon, being moved by Mr. Behrens and seconded by Mr. Seymour (Coventry) to the effect that the meeting rejoiced "That a Royal Commission had been appointed by Government to visit the leading Technical Schools on the Continent, and urging that the Commissioners should especially enquire into the influences which such schools exert on the industries of the localities where they are established, and if necessary suggest some means whereby such schools may be established and efficiently conducted in this country."

THE FRENCH TREATY.

This overwhelmingly important subject was dealt with on the motion of Mr. Ormerod (Halifax), who was seconded by Mr. Edge (North Staffordshire), and the resolution, as finally adopted, was expressed in these words:—"That this Association, whilst fully recognising the assiduous endeavours of Her Majesty's Government to negociate a Commercial Treaty with France, would strongly express an opinion that no treaty would be acceptable that does not proceed on more progressive lines than the one now about to lapse." This was carried unanimously.

PRESIDENT GARFIELD.

A resolution was passed expressive of the unanimous feeling of regret experienced by the Associated Chambers of Commerce at the lamentable death of the United States President under such poignantly painfully circumstances, and expressing their wish to condole with the American nation and Mrs. Garfield in their deep sorrow and affliction.

Votes of thanks to the President (Mr. Monk, M.P), the Plymouth Chamber of Commerce, and the Mayor and Corporation of Plymouth, concluded the business portion of the Session; and according to the unvariable custom of English bodies after the discharge of public business, the Associated Chambers adjourned to a repast, which was worthy of the occasion, and the guests, under the presidency of the Earl of Morley; the day following being devoted to jauntings, and visits to places of interests in the neighbourhood of Plymouth.

THE FRENCH TARIFF & TREATY.

As was generally foreseen by those best able to judge, the negotiations have halted on the attempted application of the principle of specific duties to textile manufactures. Indeed from the moment when English ministers declared that they had admitted the universal application of specific duties in their negotiations with the French it became obvious that such a rupture as has now occurred, was inevitable, sooner or later.

If the Government had referred to the records of the negotiations antecedent to the Treaty of 1860 they would probably have hesitated before giving in their adhesion to the general rule of weight duties; as, although Article 13 of that Treaty provides that the *ad valorem* duties laid down by Article 1 shall be converted into specific duties, Mr Cobden and his fellow commissioners found it impossible to discover equitable equivalents to apply to textile goods generally, hence both the French and English Commissioners concluded to agree that on these and some few other classes of goods *ad valorem* duties only should be levied. This mode of assessing the French duties on textile goods, has consequently prevailed and will continue to operate until the expiration of the present Treaty. There is one other important consideration which should have weighed with the English Government, before accepting the principle of specific duties all round, and it is this—the cry of specific duties in France is of Protectionist origin, and is of recent date M. de Fleix shews this most clearly in *La Nouvelle Revue*, where he says that in the negotiations opened in the spring of 1877 "la question des droits specifiques n'avait pas été soulevée."

For ourselves we fail to see any sufficient or just reason why *ad valorem* duties should now be abandoned, on the contrary instead of giving the French any additional advantages in this branch of trade, we see many reasons why the opposite course ought to be followed. Since 1860 the French, assisted by our improved machinery, having cheaper labour than we have, and aided by a 10 per cent. duty on all imported textile goods, have advanced in the production of these goods until the largest exports they make are in woollen manufactured goods, surpassing even their exportations of wine or brandy. Some persons whose immediate interests do not centre in the production of textile

manufactures object to any particular attention being devoted to the consideration of our textile trades in the Treaty negotiations, but when it is remembered that the united exports of cotton and woollen manufactures alone, exclusive of yarns, constitute more than one-third of our total exports, it becomes pretty obvious that any incapacity under which these productions are unfairly placed must be an injury of no small magnitude to the commercial welfare of the whole country.

The writer we have already quoted declares boldly that everything that tends to impede the renewal of the Treaty should be brushed aside, both the proposed increase of duties, and the substitution of specific for *ad valorem* duties; and for a very good reason, for under the existing Treaty "the English market is, "for French productions, *five* times more important than the "French market for English goods." While, with regard to textile goods, he shews that in 1877 the English market took in French woollen and silk manufactures alone £11,720,000 sterling; and on the other hand the French market only absorbed of English manufactures in cotton, wool, silk, linen and jute, a total of five millions worth With these figures and facts before our eyes, the next consideration that arises is as to whether it is worth while to submit our trade with France to further disabilities in order to secure such one-sided results, which results must inevitably become diminished thereby? We must confess that it would be very doubtful wisdom to make any such submission and especially so when we are told by the French Liberal journals that, if negotiations utterly fail with us, they will be "compelled to re-model the general tariff in order not to be ruined by its application"—that is the New General Tariff.

For ourselves we advise that under no circumstances whatever should the English Government submit to the application of specific duties to textile goods, and if exact equivalents could be found for *ad valorem* duties, which is simply impossible, the equivalence would only last so long as raw materials and costs of production were at the exact figures at which they stood at the moment of the signing of the Treaty; and so the future of these trades would be rendered precarious, and utterly uncertain, because they would be resting on a constantly shifting basis.

The Textile and Dyeing Departments of the Yorkshire College.—Session 1881-2.

Without seeking to minimise the importance of the *role* of the statesman and the diplomatist, in its relations to trade and commerce, we may safely assert as an axiom, that the future of British industry depends infinitly more upon its truly artistic character than it does upon protocols and diplomatic notes; and this in its turn, depends entirely upon the extent to which such institutions as the Yorkshire College are made use of and appreciated by those for whom its benefits are more immediately intended. *Aide toi, et le ciel t'aidera* is true in regard to all matters of enterprise, whether of a personal or national character. No matter what apparent advantages may be obtained by commercial treaties, unless these are fully supported by corresponding advances in the style and finish of our productions, the advantages obtained by diplomacy will prove to be merely ephemeral.

Having these convictions, we need offer no apology for prominently drawing attention to the syllabuses of the Textile and Dyeing departments of the head-centre of our efforts in Yorkshire for the promotion of really high-class technical instruction, the Yorkshire College, the eighth session of which opened on Tuesday the 4th instant. The Textile department is conducted by a gentleman whose qualifications for the office are almost unique, and whose experience in connection with this branch of instruction has grown with the growth of the Institution. The syllabus of this department is divided into two distinct ranges of Day instruction and Evening instruction; the former comprising a First and a Second Year's Course, the latter an Ordinary and an Advanced Course. The First Year's Course consists of fundamental studies and work, embracing Practical Weaving on small looms, Plan-drawing, Drafting, Designing and Colouring of certain makes of cloth; together with a knowledge of the various materials employed, and the necessary operations used in finishing. The Second Year's Course includes Practical Weaving on large hand looms, together with a more extended study of the other subjects of the First Year; at the same time affording an opportunity for the special study of any particular branch of manufacture in which the student may happen to be engaged, or in which he may especially wish to perfect his knowledge. The Evening classes seem to be somewhat of an epitome of the Day classes, necessarily contracted to fit in with the length of the Evening Session. The total fee for the First Year's Course is £11 11s. 0d.; Second Year's £8 8s 0d.; and £2 2s. 0d. for each of the Evening Courses.

The Dyeing department is under the management of a gentleman of whose qualifications, the same eulogistic words may be employed as in the case of the Textile department, and to which department this one is a necessary appendix. The syllabus of this department is also divided into a First and a Second Year's Course, although it is permissible for a student who has a sound knowledge of elementary chemistry to devote the whole of his time to the Lectures on Colouring matters, and the Practical work of the Dyehouse; at the same time a student may choose whether he will study one, two, three, four, or six days per week in the session, for which he will pay fees proportionate. The work of the College absorbs 39 hours per week in the full course, in the session of each year; of which, in the First year, 12 hours are spent in Practical Laboratory work, and 12 hours in Practical Dyeing. In the Second year 12 hours are spent in the former subjects, and 24 in the latter. The Lecture Course extends from January to June, concurrently with the Second and Third terms, and includes Textile Fibres, Natural and Artificial Colouring matters, Mordants, and Bleaching, fee £3 3s. 0d.

The fees vary from £5 5s. 0d. to £21 0s 0d. for the yearly courses The Cloth-workers Company, whose munificence chiefly has enabled this scheme to assume its present vital and practical form, give four Scholarships of £25 each for competition in the Textile Department, by persons between the ages of 16 and 24; and two Scholarships in the Dyeing Department on similar conditions. In order to enable students to attend from a distance, a reduction is made in the fees to the extent of one-third in the case of those residing more than 12 miles from Leeds, or one-fourth if living more than 6 miles from the town.

It only remains for the inhabitants of this busy textile district to shew their appreciation at once, of their own interests, and the generosity and high public spirit of the founders and supporters of this noble institution, by joining it, and partaking of the benefits so patriotically provided for them.

Technical Training.

On Thursday the 15th ult, Sir R. A. Cross speaking at Bolton, on the great value of Technical Training, said it was greatly to the credit of the City and Guilds of London Institute that they had come forward so handsomely to provide technical instruction relating to all kinds of trade, and it was particularly pleasing to him to think that the Clothworkers Company, with which he was connected, had done so much good to Leeds and elsewhere. There was some little misapprehension as to what was the object of the City and Guilds of London Institute, and the means they adopted to carry that object out. What they wanted to teach were applied physics, applied chemistry, applied mechanics, and applied art. Their great object was to teach people the practical application of the principles of science and art to all the various trades throughout the country Their object was not to teach the trades themselves. There was no attempt made by the Institute in any form or shape to interfere with the absolutely necessary training for which the workshop and factory were the fittest places. There was no desire whatever to interfere with that which everybody must go through if he wanted to be an expert and skilled workman. But the object they had in view was this—they wanted to get into the heads of the working men that which would enable them to apply all the science and knowledge which other men have thought out, so that they might become much better skilled workmen than those who were igno-

rant on such matters. Such was the principle upon which this Institute was formed. He was proud to say that they had contributed no less than £100,000 for building the great central institution in London. That was not to be confined to London alone, but its advantages would be open to the community throughout the country. He did not think anyone who had not seen the actual working of these technological examinations could have any possible notion of the effect they had in the technical training of the workmen throughout the country. But working men were gradually finding this out, for while only three years ago there were but 292 candidates for these examinations, in 1880 the number rose to 816, and this year there were 2,500 candidates studying for the next examinations. In 1879 the institution provided £334 for these examinations, in 1880 £1,500, and this year the cost will be about £3,000. The right hon. gentleman urged working men to get all the good they could from these institutions. It would not do for them in this busy nineteenth century to stand still. If they did so, depend upon it they would go to the bad. Referring to education in connection with commerce, the right hon. gentleman said that we in England had no longer a monopoly of trade. We were now in the keenest competition with all the nations of the world, and unless we made ourselves as perfect as we could we should not be at the top of the tree, as we ought to be, and as hitherto we had been. America had made rapid strides, but though the Americans possessed marvellous vigour, earnestness, and capacity, he believed Englishmen, were equally possessed of the same virtues.

Some Causes of the Decline of our Trade, and their Remedy.

There has recently been an article in the *Quarterly Review*, ably written, from a Protectionist standpoint, in which the writer makes out that the shipments in trade have been more than 180 millions a year for the last three or four years. But he had omitted to deduct from that shipment the foreign colonial produce, which never came into this country at all, and which amounted to 60 millions a year, which left it about 120 millions. Mr. Mongredien has written a very able pamphlet, and he states in that pamphlet that we only import about nine per cent. of our manufactured goods, and all the rest are raw materials and articles of food. He just made the same mistake which the *Quarterly Review* did. In estimating the total imports he included the foreign colonial produce, which simply passes through the country and goes away, and not only that he omitted a very large number of articles which he ought to have included, and which amounted to 17 millions sterling. Mr Mongredien also falls into another error. He points out, we have by far the largest portion of the carriage of the goods of the world—of ocean traffic. Nearly all our exports and imports are brought by our own steamers. He admits it is very difficult indeed to estimate what that is; but he puts it down at 11 per cent. carriage, insurance and other expenses. I have very carefully gone into that, and have had correspondence with shippers of America, Australia, and other countries, and I cannot find that anybody, even exporters to the most distant countries, are paying anything like the amount he puts it down at. I should be very glad indeed to undertake the carriage of all the exports and merchandise of the country at six per cent. But still, at 6 per cent. it amounts to a very large sum—I suppose to at least £20,000,000 a-year, probably more. So that, taking these two items together we need not be alarmed if we find the imports exceeding our exports, by 50,000,000 or 60,000,000 or even 70,000,000 sterling a-year. But we know that for two or three years back they have been very greatly in excess of that. They have averaged for three years £120,000,000. The difference has undoubtedly been paid for either in gold or in bonds or securities which we hold on other countries. All political economists admit that the inflow and outflow of imports and exports between different countries must balance each other—unless imports come in payment for debt. Mr. Mongredien puts that point most clearly. Therefore if the exports and the channels through which exports are sent out of the country are blocked and impeded, they must ultimately check the imports. That is very clear. Therefore it is evident that we cannot go on importing so enormously in excess of our exports. Unless foreign nations can take our goods freely, our power to purchase from them must decline. Therefore we have to face this difficulty. I come now to some of the suggested remedies, and I here would say that quite as much, and probably more depends on individual effort than upon national policy or legislation. We must endeavour to adapt our productions to the wants of our customers; we must increase the number and variety of our products; and we must attend to every possible detail whereby our products can be improved. We must do as they are doing on the continent, give the most careful scientific, and technical instruction to those of our operatives who are placed in positions of responsibility in connection with our manufacturing operations. I should also say that it was very desirable to give a direct interest wherever it is possible to do so in the profits and results of the business to those who are responsible. And masters and operatives should, in every branch of manufacturing industry, co-operate heartily for their common interest. These are all matters that are under our own control and management, and we do not need to apply to Government for legislation in order to carry them into operation. Then we must open new markets. The old ones are getting partly closed, and I confess that I see very little probability of either America or the Continent of Europe taking much more from us than they are doing at present. In my opinion our great hope for the future is in trade with our own colonies and possessions. Then we must make no commercial treaties that are not in the direction of free trade. I think the country is now come to be practically of one mind on this question. We are quite ready to trade with France, if she is ready to trade with us in the direction of lower duties and free commercial intercourse. If France proposes to increase the duties on our goods, I hope England will, as with the voice of one man say, "We will have no part in it." Let us take our chance with other nations, rather than bind ourselves in such treaties which are so unreasonable and unfair. Now I come to the question of the colonies.—Here the lecturer read a short extract from an address given by Mr. Massey before the Bradford Chamber of Commerce more than a year ago. He said:—"The population of the British Empire in the parts beyond the seas are, in proportion to their numbers, by far the most extensive consumers of our manufactures. It appears, from a table prepared by Mr. Frederick Young, that the annual consumption of our merchandise per head is represented by the following figures:—United States 7s., Germany 9s. 2d., France 7s. 8d., North American Colonies £2 2s. 9d., Australia £8 10s. 8d. A more elaborate analysis, by Dr. Forbes Watson, brings out this striking result, that Australia actually consumes, in proportion to its population, a larger quantity of English manufactures than we require ourselves." The enormous Colonial Empire of Great Britain is one of quite modern growth. When George the III. ascended the throne in 1760, *i.e.*, about a century ago, the population of the British Empire did not number 12,000,000, inclusive of the colonies. It now numbers no less than 300,000,000. The British dominions at present comprise, in Europe, an area of 120,000 square miles, with a population of nearly 39,000,000; in India (including the territories of subject native princes), an area of 1,740,000 square miles, *i.e.*, nineteen times the area of Great Britain, and a population of 240,000,000. In Ceylon, an area equal to half that of England, with a population of nearly 2,500,000; in Australia and New Zealand, an area equal to that of Europe, with a population of about 2,600,000; in North America, an area 30 times that of Great Britain, with a population of about 4,000,000; in the West Indies, Honduras, &c., an area exceeding that of Great Britain, with a population of about 1,100,000; in South Africa, an area more than three times that of Great Britain, with a population of nearly 1,200,000; in West Africa, an area equal to half that of England, with a population of 400,000. To these may be added Mauritius, and other small islands, giving a total population to the British Dominions of nearly 300,000,000, so that the British Empire is the most populous in the world, next to the Chinese (400,000,000), comprising within it one-fifth of the whole human race. The Russian Empire, which occupies the same area, contains a population of only 82,000,000. The Australian Government

did wisely in seizing the opportunity, afforded by the recent exhibition in Paris, of setting before the world some striking evidences of the results achieved by this extensive emigration into countries possessed of great national resources, and wanting only the hand of man to convert a wilderness into a garden. A still more accurate and complete knowledge may be gained in the volumes of Mr. Wilson. The colonial abstract published by our Satistical Department contains a mass of well-arranged statistics. The total yield of gold in Australia and New Zealand, since the first discovery in Victoria, was estimated by Mr. Wells at £247,000,000 sterling, but the value of gold is small compared with the accumulation of agricultural wealth. According to the tables appended to the agricultural returns of Great Britain for 1876, the Australian Colonies own altogether about 52,000,000 sheep, New Zealand has nearly 12,000,000. The number of sheep in Russia is estimated at 48,000,000, in France 26,000,000, in Germany about 22,000,000, and in the United States about 34,000,000. New South Wales has more than 3,000,000 head of horses and cattle. Mr. Read's essay on New South Wales contains a striking summary of the growth of the population and of the trade of the Antipodes. The population of Australia increased in thirty years from 214,000 to 2,000,000, or 834 per cent., whilst the population of the United States increased in the same period by 660 per cent. The trade rose in the same period from less than £6,000,000 to more than £63,000,000, or 950 per cent. Two thousand two hundred miles of railway had been opened, and the annual revenue of the Australian Governments was £14,000,000. It was believed until a recent period that the fertile lands formed a comparatively narrow fringe round the coast of Australia. Later experiences have shown that the interior of the continent contains vast tracts of fertile land. In reference to the question, how can we develop our trade with the colonies? In the first place we may disseminate all through the country reliable information about the colonies; let the people know what they are, and where they are, and what sort of emigrants are likely to do well in the colonies, and give them every encouragement and every facility for going there. Then we may also encourage emigration there rather than to the United States. Then another thing that the colonies ask is, I think, reasonable—that they ought to to have some direct representation in the English Parliament. They complain of their isolation, and of the Home Government sometimes committing them to treaties with foreign Powers without their having a word to say about it. I think it is perfectly reasonable they should be represented, and it is a question the country will have to look into. There is another thing that Canada asks, viz., that there shall be a tariff somewhat in favour of the colonies—that we should put on a duty, say of 5s. per quarter, on corn coming from the United States, and take all free from Canada, and British possessions. They assure us that in two or three years' time they will be able to supply us with all the corn we can possibly require. This, as you know, is a plan advocated by Mr. Ecroyd, M.P. I am not here to advocate its adoption, because I think it requires more serious consideration. Certainly if we can do anything, without injuring ourselves, to bring America to her senses, it is very desirable. I would decline absolutely and positively to enter into any commercial treaty with any country whatever unless that treaty were in the direction of Free Trade. And unless France and other countries will meet us on reasonable terms, I am prepared to advocate at once a considerable addition to the duties on wines, spirits, and silks, and on all articles of luxury, and then to abolish the duties on tea and coffee, most of which comes from our colonies and possessions, and from China. I would relieve the agriculturists of as much direct taxation as possible. They need all the help we can give them. We have tried the influence of example for more than 30 years, and I am thoroughly convinced we cannot fight this battle single handed; we must have alliances. If France or the United States of America would agree as between them and this country that there should be no commercial restrictions, then we could fight the battle against the world, and the world would have to come to our system. But as we have tried by our example and teaching, and have failed, the time has come when we must try to adopt a different policy, and we must go back to retaliation.—*Lecture by Henry Mitchell, Esq, J.P., Bradford.*

SCIENTITIC AND ART NOTES.

Decorative Art is progressing in America. Pictures are being discarded, and their places taken by tapestry. The decoration of Mr. Vanderbilt's drawing-room is in the hands of a corps of lady embroiderers whose little little bill is expected to amount to about £2000.

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Mr. Thomas Armstrong will succeed Mr. Poynter, R A., as Art Director at South Kensington Museum, and Mr. Sparkes (now Head Master) as Principal of the National Art Training School. Mr. Poynter has, however, consented to continue his connection with the Department as Visitor of the Training School.

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A new College of Practical Engineering has been opened at Muswell Hill, near London, under the auspices of a number of the most eminent practical engineers in the kingdom. The principal of the college is Mr. John Bourne, C.E. The instruction given will combine the best theory with the best practice, and a special feature will be that a number of treatises illustrative of engineering art will be produced at the college, forming together an engineers' library.

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Mr. Renouard, of Rouen, has been experimenting on the spontaneous combustion of rags and greasy cotton waste. A handful of rags, bathed in boiled linseed oil and squeezed, was mixed with dry cotton and put in a box with a thermometer. The room was kept at 75 deg. C. After one hour and a quarter the thermometer rose to 173 deg., smoke came out of the box, and the whole took fire as soon as air was introduced. Cotton wetted with linseed oil, not boiled, took fire after after six hours.

* * * *

The official programme of the National Exhibition of Irish Manufactures, Arts, Produce, and Industries, to be held in Dublin next year, has been issued. The exhibition will consist of (1) exhibits of articles manufactured in Ireland and of Irish raw material; (2) machines suited to Irish industries, those made in Ireland being distinguished from those made in other countries; (3) an exhibition of works of art by Irish artists and residents in Ireland; and (4) exhibition of a general loan collection of works of art. There will be no charge for space to exhibitors, and prizes will be awarded.

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Monster steam engines seem to be one of the features of the day. The Centennial engine in Machinery Hall, Philadelphia, was considered a monster in size and power. It is rated at 500-horse power. They are now putting up a 2000-horse power engine for the Providence Water Works. These are very large for stationary engines. But engines of much larger power have long been in used in ocean steamers. There are now several transatlantic steamers which develop from 4000 to 5000 horse power; but the mail Cunard steamer service will develope 10,000 horse power.

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The friction of a belt upon a pulley depends upon the pressure or tightness, and upon the number of degrees of contract. It is independent of the pulley diameter, or of the pulley width. Generally, belts running from the large to the small pulley slip on the large and not on the small one. Tightening pulleys are placed on the slack side of the belt near the small pulley. They increase the friction of driving. They should always be as large in diameter and as free as possible. The best tightener is the weight of the belt on the slack side. Loose belts last longer than tight ones. Horizontal and inclined belts are better than vertical, and short ones, as requiring less tightening.

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The number of fixed boilers in Germany last year, producing the force necessary for industries, was (exclusive of military and maritime establishments), 49,511. Of these, 12,276 (or 24·8 per cent.) were for industries dealing with articles of consumption; 11,375 (or 22·7 per cent.) for mines, coal-pits, salt-works, and metallurgical establishments; 6981 (14·1 per cent.) for textile industries; 2,732 (or 5·5 per cent.) for construction of engines, tools, and apparatus, and so on; 3056 boilers (or 6 per cent.) served merely for production of steam, while 12,579 (or 25·4 per cent.) served to produce steam, and to give motion to engines.

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A firm of machine-makers at Leobersdorf, near Vienna, has taken up the manufacture of steam engines without boilers, according to Hock's patent. In this system, the steam-furnace (so-called) is closed on all sides to the atmosphere by solid fire-proof masonry, and steam is formed in it from a spray of water. A blast of air is sent in under the grate. The resulting mixture of steam and gases cooled by the water, is called "air-steam;" it passes to the engine through a sieve system, which keeps back dust, &c. The consumption of fuel for the smallest (and so least economical) engines is stated to be 1 kilog per effective horse-power per hour. Fuel is saved in virtue of the combustion being in a closed space, where expansion of air cannot occur; and with constant volume of furnace, the tension of steam must increase. Another advantage alleged is in the utilising of the gases of combustion with the steam. An Austrian specialist pronounces the mode of vaporisation to be without risk of explosion.

ORIGINAL DESIGNS.

Our first plate represents a design for a tapestry fabric, the ground of which should be pale Blue, the leaves a fresh Green, outlined and shaded with Maroon; the large flower a deep Orange, freely shaded with Maroon, and the smaller flowers a pale Gold, also shaded with Maroon.

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The second design is drawn for a Table Cover, for which the following colours might be used:—Black ground, with a Blue, Olive and Gold of light shades. The space at our disposal has not admitted the possibility of showing as much of the pattern as we could have wished, hence we have been obliged to omit the corner-piece. For the same reason we have been compelled to hold over the sketch of the carpet (we had intended issuing in this number) until next month, when we hope to present it as a double-page plate. The Table Cover is drawn slightly under scale.

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Our third plate is intended for a Cretonne. Such a variety of colourings could be employed in this design, that we think it best to leave it to the judgment of manufacturers of this class of fabrics

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*** We beg to inform manufacturers and others that adaptations of designs, published in the "Journal of Fabrics," can be made at the Office by experienced Designers, and that Original Designs can also be furnished at moderate charges.

We have received a prospectus from the Directors of the Fine Art and Decorative Exhibition, of the Second (Winter) Exhibition to be held shortly at the New Galleries, Bond Street, London. The object of this Exhibition is to give Artists, Designers, and others in London and in the provinces, an opportunity of bringing before the notice of patrons of art and the public generally their productions, with a view of effecting sales. The works admissible include Paintings in Oil, Drawings and Water Colours; Etchings, and other works in black and white; Designs, Sculpture in all materials; Wall Decorations, and Art Furniture; Works of Art in Gold, Silver, and other metals; Porcelain and Pottery; Enamels and Glass; Carvings, Mosaics, and other Inlays; Embroidery, Tapestry, and other Fabrics, and any other objects of artistic character; together with Books or other Publications, Prints, Photos; illustrative of Fine and Decorative Art. The Inaugural Exhibition (just closed) although opened late in the season has procured substantial benefits to many of its contributors, besides the indirect advantages of publicity; whilst some exhibitors have effected sales and obtained orders to large amounts.

In our next Number we publish an Original Article on Textile Fabrics by Lewis F. Day, Esq.

MONTHLY TRADE REPORTS.

Wool.

At the public sales of colonial wools in London prices have taken a more favourable turn, the best qualities of merinos and cape snow whites, &c, being ½d. to 1d. per lb. higher than at the commencement of the sales, whilst the lower qualities have slightly improved in value, although they are yet ½d. to 1d. cheaper than at the sales early this year. The tone of the market is generally hopeful. The fourth series of the year will commence on November 22nd. At the East India sales at Liverpool from the 20th to the 23rd ult., the best qualities of wools brought rather higher prices than the July rates, whilst the medium and common ruled from 5 to 10 per cent. higher, meeting with an active demand. In Bradford an improved tone has been apparent, and wools have advanced ½d. per lb. Business on the whole has been in a more satisfactory state than for some time past. At Leeds prices have been fully maintained, with a slight tendency upwards, no doubt through the advance made in good qualities at the London sales. At Halifax staplers have adhered firmly to full rates, and in consequence business has been rather restricted, as spinners have covered their wants; but yet there has been no giving way in prices. At the Edinburgh and Glasgow sales a marked improvement has taken place, a large quantity of wool has changed hands at increased prices. One marked feature of the market has been the absence of speculation, the buyers having been spinners. This fact gives great stability to the market. In the yarn trade at Bradford and Halifax, the home business has improved, but on account of spinners asking an advance in price, it has been somewhat restricted; the export trade has also improved in tone and better prices have been obtained.

Cotton.

In both Liverpool and Manchester the past month has been an excited one, owing to the action of the "cotton corner." The markets have been anything but good in tone, and prices have been almost unquotable. Better things are hoped for now that the "corner" has closed and the mills throughout Lancashire have resumed work. In yarns both the home and export trade has been in a dragging state, some few enquiries have been made from Russia, Germany, &c., but they have not resulted in much increase of business At Nottingham yarns have been slow of sale, but prices on the whole have kept firm.

Woollen.

In the woollen trade considerable activity has been exhibited at Leeds, Dewsbury, Batley and Halifax, machinery throughout the district has been well employed; prices however still rule low, and are not very remunerative to manufacturers, but they hope for a better state of things in the future.

Silk.

At Coventry, Macclesfield, &c., the markets during the month have gradually improved in tone; higher prices have been realised for the raw material; but manufacturers have complained of the great difficulty they have in procuring a proportionate advance in the prices of the manufactured articles.

Linen.

The market has improved generally; spinners and manufacturers as a rule have been well employed and working to order. Prices of both yarn and cloth have tended upwards The home trade has been good, some large sales have been made at full rates. In the export trade more has been done at firm prices.

Carpets.

At Kidderminster, Dewsbury, Kilmarnock, &c., trade has shown a little more activity. Brussels, of a cheap kind, has been selling well, the same may be said of Tapestry. Dutch and Kidderminster have sold rather slowly. Manufacturers still complain of the unremunerative character of their sales.

Lace.

Business on the whole, has been good. Many orders for low-priced goods have been refused, the manufacturers finding it impossible to fulfil them in anything like a reasonable time. Fine cotton-laces are much sought after, anything new in the line being quickly taken up. There is a general opinion that the trade will be brisk for some time to come.

A somewhat curious instance of the manner in which electricity is nowadays used for the purposes of civilised life is seen in the arrangements adopted at one of the fire-engine stations in Cincinnati. In the sleeping-room the beds are arranged as radii of a circle, having a space in the centre to which the feet of the bedsteads point. The coverlet of each bed is connected to a cord, and the several cords are gathered up into a rope which passes over a pulley near the ceiling. A heavy weight is attached to the rope, and the latter is held firmly by a clutch that tan be released by a magnet. When a "call" is received, the watchman on duty touches a button, which sets the electric currant in motion, ringing the bells of the station, pulling the coverlets of the beds, and suspending them in mid-air, clear of the awakened fireman. It is not pretended that more than a few seconds of time is saved by this device, but it is by a number of seconds saved here and there that the fire brigades of the United States have earned the title to be considered the first of the kind in the world.

Messrs. Goldsborough and Co., and the Australasian Banking Corporation.

The "Australasian Insurance and Banking Record" of August 10th, brings news from Melbourne of the amalgamation of the Australasian Agency and Banking Corporation, Limited, with the firm of Messrs. R. Goldsborough and Co., wool-brokers.

The important announcement was made by the directors at a meeting held early in August, that in accordance with the powers they possessed, they had effected a junction of interests with the great wool-brokers firm, and that the business would, in future, be carried on in the name of R. Goldsborough and Co., with the addition of the term "Limited."

Messrs. Goldsborough and Co. receive for their large business (which is estimated at £30,000 per annum), £100,000 for goodwill, and £132,500 for the freehold premises. The payment is made by £120,000 in cash, and by the issue to them of 75,000 shares, £1 paid up, at 10s. premium. This 10s. premium is to be added to the reserve fund of the new corporation, making it up to the sum of £62,500 Whilst the Australasian Company pays Messrs. Goldsborough and Co. £100,000 for goodwill, it gets back £37,500 for its own goodwill (which now stands in the reserve fund). So that the price paid by the company for this magnificent business is really £62,500, or a little more than two years purchase. The company acquires a business unequalled in the colonies, and in return Messrs. Goldsborough and Co. are made partners in a large limited concern, which embraces some of the wealthiest men in Australia, and who can command large sums of money, at the very lowest rates in the London market. The general management of the new company will be in the hands of Mr. F. E. Stewart, to whose great skill is to be attributed the amalgamation of the interests of the Banking Company with Messrs. Goldsborough and Co.

On a rumour being whispered of the fusion of the two concerns we understand the value of the Agency shares rose from 31s. 6d. to 40s. for 20s. paid up; and on the official announcement being made they advanced to 52s. 6d., but have since settled down to 48s., ex. div. of 1s., at which large numbers have been sold. It is estimated that on the basis of past business, the new company ought to make a profit of £50,000 per annum on a paid up capital of £200,000, or 25 per cent. per annum.

The Countess of Bective and the Wool Trade.

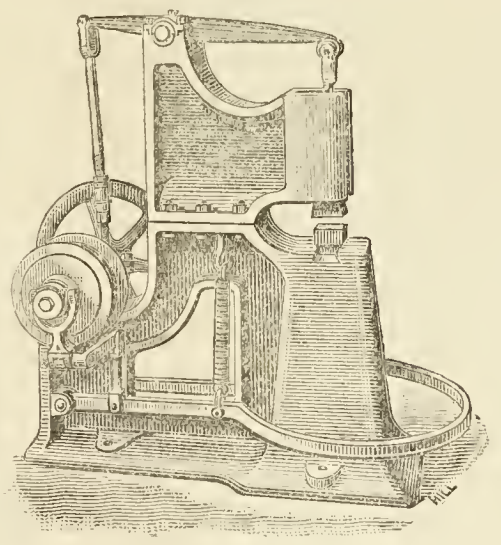
It is well known that the Countess of Bective has recently taken great interest in the wool trade of this country. In order to give practical effect to her views, her ladyship gave a special prize for the best three fleeces of wool shown in connection with the annual exhibition of the agricultural society of Kirkby Lonsdale, near Lancaster. The competition took place on Friday the 16th ult., and the result was to bring together a large amount of wool exhibited by farmers residing within the limits of the Kirkby Lonsdale district. In the same tent in which the fleeces were displayed were samples of white alpaca, Nottinghamshire and Yorkshire wools, goats' wool, and cashmere wools, exhibited by Messrs Foster and Son, of the Queensbury Mills, Bradford There were also specimens of Leicester wool grown in New Zealand, and bred from merino sheep, and half-bred wool from Australia—the produce of a cross between merino and Leicester sheep, exhibited by Messrs. Hargreaves and Co., of Kendal. A large number of patterns of goods manufactured from the above was also exhibited. Speaking at the luncheon of the society, on behalf of Lady Bective, Mr. Punchard said her ladyship was much interested in the wool question, and her object in giving a special prize that day for wool was to secure a show of the various kinds of wool produced in the district. The samples of foreign wool exhibited would show English farmers what they had to contend with—the quality of the foreign wool being superior to what could be produced in England, the fleece being shorter in staple, but softer in quality. There were, however, various ways in which the British farmer could improve his wool, namely, by judicious crossing, and a careful selection of the breeding stock. Another way in which they could improve the wool he had been asked by Lady Bective to point out. The manufacturers complained that farmers sent English wool to them in such a dirty state that they could not make it up to the best advantage. After exhibiting two samples of Leicester wool—one showing how clean it might be made, and the other the state it was in generally when sent to market—Mr. Punchard said the highest price obtained at Kendal wool market was paid for wool sent from Levens Hall (General Upton's), and he had been told that the chief cause was that it was more carefully washed—in fact Mr. Milne, the steward, had it tub-washed. Mr. Punchard then went on to speak of the association which Lady Bective had started, contending on her behalf that it was not a political one, neither was it, as had been stated, intended in the interests of one trade only, but generally to promote the use of British-wool manufactured goods—not only the lustre fabrics of Yorkshire, but the tweeds of Scotland, the homespuns and flannels of Wales, and the friezes of Ireland.

MACHINERY, TOOLS, ETC.

Dunham's "Patent Spring Beam Forging Hammer," for Millowners, Machinists, &c.

We had the pleasure a few days ago, of inspecting one of Dunham's "Patent Spring Beam Forging Hammers" at present being made by Messrs. George Booth and Co. of Halifax. We can say with the utmost confidence, that they are well worth the attention of such millowners, &c., as keep a staff of mechanics to repair their own machinery, &c.

The "Hammer" is an American patent, and the royalty has been purchased for Great Britain by Mr. Charles Sholl of London, who has appointed Messrs. Booth and Co., sole makers in this country. As will be seen from the plate we present, it



consists of a "spring beam," connected at one end by a rod with a crank, and at the other with the "tup" of the hammer, the beam working on a pivot a little out of the centre, the shortest arm being the one nearest the crank. By the use of this spring beam, a blow of a very elastic character, and exactly such as is required to produce the most highly finished work, is given by the long arm. The weight of the blow can be altered at will, instantly, from the heaviest "dead" blow to the lightest touch, by the operator placing his foot on a lever, and varying the pressure as required. Very little more than half the power is requisite to drive the hammer at "speed," that is required for any other now in use, as a great part of the force of the impact blow is conserved in the spring beam, to which the hammer-head is attached. There is a total absence of "shocks" to the machine, the spring beam taking up the rebound as soon as the blow is delivered. The hammer is capable of doing all classes of forging work, from the lightest jewellers' to the dressing of a 6 inch shaft; the smith requring no assistance whatever, unless he is forging long and heavy pieces of shafting. The hammers are self-contained and require but little foundation; the finished weight of them ranging from 7 cwt., to 3 tons; the floor space occupied being from 3 ft. by 1½ ft., to 6½ ft. by 4 ft.

There is no water to blow out of the cylinder and the shaft is continually running ready for work, with the advantage of a clean and dry hearth. The anvil and loose hammer in the "tup" are so constructed that any form of "die" can be substituted. The simplicity of the hammer will at once be appreciated by any person having had experience in forging iron and steel.

The prices range from £35 to £165, according to size, &c. We understand that a large number of the hammers are at

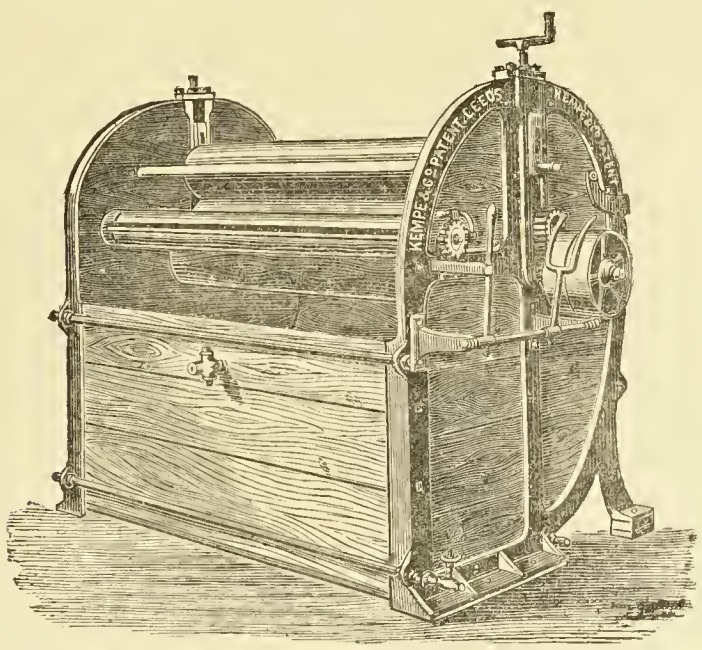
work in America, where they are giving great satisfaction, and we have no doubt that Messrs. Booth and Co. will have a large sale for them for some time to come. Messrs. Larkin and Varnum writing from Sharon, Vermont, say:—"In responding to your late inquiry as to how we liked your spring-hammers we purchased some seven months ago, we can only say that they far exceed our expectations. In simplicity, power, rapidity of blow and ease of application, they, in our experience and estimation, are fully equal, if not superior to steam hammers, while the cost of operating and repairing is far less." Mr. C. A. Eastman, who writes from Concord, North Hampshire, says:—"I am satisfied that Dunham's patent is the best hammer now in use;" and Mr. D. Smith, in the same district, says:—"It it the best and most effective hammer that has come under my observation."

An Improved Washing and Scouring Machine.

We are glad to bring before the notice of our readers an improved machine for washing and scouring woollen and union cloths and worsted coatings.

The machine has been designed, patented, and is now being made by Messrs. W. Kempe and Co. of Holbeck Mills, Leeds.

At the Crystal Palace Exhibition this machine is the only one exhibited for treating fabrics after they leave the loom. The change in fashion, which has caused worsted cloths to be worn in place of faced ones, has made way for improvements in machinery to be applied to this manufacture. It has been proved that worsted cloths scoured by this machine, are not only cleaner and superior in appearance to those washed by the ordinary method, but also softer to the touch. A great saving of time and labour is also secured.



The object of scouring pieces being to free them from the oil used to facilitate manufacture, as well as from other impurities gathered from different sources, it is to the interest of the producer to effect this object at the least possible cost, and without injury to the cloth. In order to accomplish this the material is soaked in alkaline ley and thus a soluble soap is produced; but both soap and dirt are still in the cloth and must be removed. To do this, the process of squeezing out the dirty suds and immersing the cloth in clean ley must be repeated. The usual method is to soak the pieces in the ley tank contained in the washing machine, then pass them crumpled between two wooden rollers. The ends of the material being sewn together—the operation is continued until the grease or dirt is removed. The rollers of the ordinary machine being inelastic, the cloth must be squeezed in a rope-like manner in order to obtain the necessary spring, and it is therefore rendered too compact to absorb readily the new ley. This continual crumpling is also injurious to the fabric.

In the new apparatus designed by Messrs. Kemp, the cloth formed into an endless web, is drawn from the tank in a smooth sheet, open to its full width (a suitable tension being provided by its being drawn through a split roller) and passed over metallic rollers covered with an elastic and waterproof composition. The pressure of these elastic rollers removes the dirty sud without any creasing of the material and thus leaves it prepared to absorb clean ley.

ODDS AND ENDS.

The guarantee fund for the contemplated exhibition of Irish manufactures in Dublin now amounts to £22,000.

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The wool production of the United States is estimated to have risen from 146,000,000 lb. to 264,000,000 lb., an increase of 118,000,000 lb., or almost 75 per cent.

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The first process of silk manufacture has hitherto been admitted into the United States without duty, but it is about to be brought within the tariff. It is feared that the trade which the Yorkshire silk manufacturers have in those materials will in future no longer be able to be conducted with profit.

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Early in the summer a large number of male and female millhands emigrated from Galashiels to Cornwall, Canada, where employment had been promised them. In writing home they expressed the keenest disappointment with their wages and work, and wish they had been contented to remain at home.

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The Centennial Exhibition Building—which originally cost £320,000—has been sold at the Philadelphia Exchange for £19,400. The building was 1830 feet long and 464 feet wide. In its construction 75,000,000 feet of timber, and 85,000,000 lbs. of iron was used.

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A firm in London who have been paying a large sum annually for the folding of Lace Curtains, having asked themselves whether the machine used for the folding of newspapers might not be applied to their manufacture, have produced a machine which folds the most delicate laces in a very satisfactory manner.

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The *Times* says that as the people in the country villages have been unable to see the apertures in the wall letter-boxes after dark, Mr. Rea, the Post Office surveyor for the Eastern Counties district, has caused the apertures of the wall boxes in the neighbourhood of Cambridge to be encircled with luminous paint. The experiment has been successful.

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The latest invention reported by a Japanese is that of a Shinshiu man, Mr. Otsuka Minakichi, living in Shiba, Tokio, who, after extensive experiments, is said to have succeeded in making rifles of silk. They are alleged to be "rigid as iron guns, whilst they are easy of carriage and have a very long range."

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A correspondent of the *Foreman Engineer and Draughtsman* assures its readers of that print that America manufactures certain cotton clothes cheaper and better than they are manufactured in England. The writer has worn this cloth, and can testify to what he says. He attributes this to the use of China clay. It is true than Englishmen cheat by the use of China clay: but it is not true that the Americans can make cheaper and better cloth. Let us condemn a roguish practice without condemning our skill and ability as manufacturers.

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The Hungarian Board of Trade have for the first time published the returns of imports and exports. From these returns we learn that Hungary exports more raw materials than manufactured articles, and imports more manufactured articles than it exports. The total value of its export is greater than of its import, as indeed the interest of Hungary's foreign debt requires.

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The emigration to the United States, according to the report of the Immigration Commissioners during the present year, amounts to no fewer than 425,000 persons of the different European nationalities. It is a curious fact that, whilst the Irish emigration for August only reaches 2,700, the english emigrants number 5,000. All, however, are eclipsed by the German contribution, which amounts to the enormous number of 14,000.

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The final result of the last census in Prussia is now known, and the total population of the kingdom is 27,278,395. Of those East Prussia has 1,933,936, West Prussia 1,405,898, Brandenburg 3,389,091, Pomerania 1,540,034, Posen 1,703,397, Schlesia 4,007,473, Saxony 2,312,007, Schleswig-Holstein 1,127,149, Hanover 2,120,168, Westphalia 2,043,242, Hesse Nassau 1,554,376, Rhine provinces 4,074,100, Hohenzollern 67,524. Of the principal cities Berlin has 1,122,440, inhabitants, Dusseldorf 1,591,369. and Cologne 702.934,

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The consumption of carpet wool in the United States during the year 1880 is computed at 59,320,412 pounds, valued at 7,699,63 dollars. This immense quantity of wool is from ten to fifteen millions of pounds greater than has been deemed a fair average annual consumption during the past few years, and indicates not only exceptional activity among carpet producers during that busy year, but as the carpets made have all disappeared and presumably been cut up and laid, it also indicates a marvellous growth of the capacity of the country for consuming carpets.

BOARD OF TRADE RETURNS.

The accounts relating to the United Kingdom for the month of September, 1881, shew that the total value of the exports of woollen and worsted manufacture during September, 1881, was £1,691,315, as compared with £1,582,954 in September, 1880, and £1,440,412 in 1879. The total value for the nine months ending 30th September, was £13,706,770, as compared with £13,542,013 during the same period of 1880, and £11,878,871 in 1879. The total value of linen and jute exported in September, 1881, was £18,334, as compared with £15,493 during the same month in 1880, and £15,838 during September, 1879. The total for the nine months ending 30th September of this year was £161,499, as compared with £177,423 during same period of last year, and 150,653 in 1879. The total value of linen manufactures exported for the month of September, 1881, was £503,689, as compared with £453,095 in 1880, and £431,760 for the same month of 1879. The total amount of exported manufactures for the nine months ending 30th September, was—In 1881, £4,457,238; in 1880, £4,610,600; and in 1879, £4,147,598.

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At a recent meeting of the directors of the Bank of England it was stated that the net profits for the half-year ended 3rd August were £703,840 11s. 4d. That is rather over £27,000 per week, or £4,500 per working day, and taking the money-making day to consist of six hours, the net profits would be on an average of £750 per hour, £12 10s. per minute, or 4s. 2d. per second.

* * * *

The Bradford Technical School is expected to be ready for opening about the middle of May next, and the council of the Technical School have resolved to signalise the event by holding an exhibition of raw materials and machinery used in the Bradford trade. The council anticipate, from the promises of support already given, that the exhibition will be of an interesting character.

* * * *

Mr. Abraham Harrison, of Brenham, Texas, has patented an improved cloth register for indicating the number of yards of goods measured. These indicators may be made to indicate the measuring of any number of yards of material, or numbers relating to other measures and weights, by increasing the diameter of the drum, or some other equivalent device, and fractions of numbers as well as whole numbers may be indicated.

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Mr. George C. M. Birdwood, M.D., C.S.I., of the Indian Museum, on whom the Queen has conferred the honour of knighthood, is the second son of General Christopher Birdwood, of the Bombay Army, and was born in 1832. After serving for many years on the Bombay Medical Staff, he was appointed special assistant in the Revenue, Statistics, and Commercial Department of the India Office, where he has had special charge of the Indian Museum, and he has examined and reported upon the stores of Indian curiosities and work of art contained therein. He has also written a handbook on Indian industries, and has commented largely upon Indian literature and philology.

* * * *

The greatest enemy which the gas companies have in the world—and they have many—is probably the Great Northern Railway, for if they succeed in a venture upon which they are now busied, the days, or rather the nights, of gas may be numbered. The company are determined to push the lighting of their carriages a step further, and to light not only their offices and platforms but also their carriages. If they succeed in this, if a little apartment half the size of a dressing-room, whose locality is York to-day and London to-morrow and the Midland counties in the interim, can be lighted electrically, the main difficulty would seem to be solved. Hitherto experiments with the electric light have been spasmodic, but if the Great Northern succeeds—then it is clear we have arrived within measurable distance of electric light in dwelling-houses.

* * * *

It was reported at the last meeting of the Manchester Chamber of Commerce, that the authorities at Bucharest are now levying an extra import duty on all goods entering that place, the pretence being that the duty is for the construction of a canal. There was some reason for anticipating that the impost would be extended to other towns. Originally this extra duty was 5 per cent., but it has since been raised to 7 per cent. on the value of the imports, which is double the amount of duty stipulated by the last treaty. Other countries, it was stated, have successfully protested against the impost. A committee was appointed to make inquiry and address a remonstrance on the subject to the Government.

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The American war stimulated the cultivation of cotton in Italy, and excited great expectations of permanent prosperity. The continued and sudden diminution of temperature during the season when the bolls are ripening proved a great obstacle to the cultivation in the southern provinces, and it is now confined almost entirely to limited districts in Sicily and the lower peninsula. The factories and private looms for weaving textile fabrics suffer greatly from competition with the importations from other countries, and the question of a protective tariff is awakening much interest. Fedele Borghi, referring to the early history of cotton manufacturing in the United States and to its subsequent marvellous growth, believes that a similar protective policy would lead to similar results in Italy.

The case of disputed right to the use of a particular selvage in a trade-mark, in which the firms of Messrs. Mitchell Bros., and A. and S. Henry and Co., of Bradford, were concerned, has been settled. After having formed the subject of litigation before the Lords Justices, the matter was referred to Mr. Charles Stead, and Mr. Briggs Priestley, of Bradford, who have arranged the terms of an amicable settlement.

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On Tuesday evening, at the annual meeting of the Preston Institution for the Diffusion of Useful Knowledge, it was announced that the trustees of the late Mr. Harris, Prothonotary of Lancashire, who left over £200,000 for useful public objects, had resolved to grant £40,000 for the foundation of a technical school for Preston, into which the present institution will be merged. The estate is being administered in Chancery.

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The first practical application of stored electricity to the lighting of interiors took place on Friday night in the smoking-room of the Junior Carlton Club. The room is ordinarily lighted by a modified form of sun-burner with about twenty-five gas burners in it. Beneath this has been suspended a shade somewhat like the shade of an umbrella, and in this fifteen British incandescent lamps are placed. The electricity comes from accumulators which were placed in the basement of the building. These had been charged with electricity at the Heddon-street works of the British Electric Light Company, and had been brought into the Club only a few hours before the lighting up took place. The accumulators used are on the Faure principle, and were sufficiently charged to last about six hours. The experiment is said to have been successful.

* * * *

Professor Artus, who has devoted himself to the discovery of the reason why woollen clothing, when washed with soap and water, will insist upon shrinking and becoming thick and acquiring that peculiar odour and feeling which so annoy housekeepers, says these evil effects are due to the decomposition of soap by the acids present in the perspiration and other waste of the skin which the clothing absorbs. The fat of the soap is then precipitated upon the wool. These effects may be prevented by steeping the articles in a warm solution of washing-soda for several hours, then adding some warm water and a few drops of ammonia. The woollens are then to be washed out and rinsed in lukewarm water. The Professor further tells us that flannel which has become yellow by use may be whitened by putting it for some time in a solution of hard soap to which strong ammonia has been added. The proportions he gives are one and a half pound of hard curded soap and two-thirds of a pound of strong ammonia to fifty pounds of soft water. The same object may be obtained in a shorter time by placing the garments for a quarter of an hour in a weak solution of bisulphate of soda to which a little hydrochloric acid has been added.

* * * *

In an address delivered before the Bankers' Convention at New York, an estimate was made of the large amount of horse-power obtained for damming up the following rivers—viz., the Passaic at Paterson, 1,000 horse power; the Merrimac at Lowell, 10,000; the Mohawk at Cohoes, 14,000; the Connecticut at Hardly, 17,000; the Mississippi at the Falls of St. Anthony, 16,000; the Androscoggin at Lewiston, 11,000; the Housatonic at Canaan Falls, 3,000; and the Oswego at Oswego, 4,000. The sum total of these is 75,000 horse power, as estimated at a given point in each river. But this is used over again on an aveaage not less than three times showing a larger total of 225,000 horse power. There are also many smaller streams in all the hill sections of the country which are utilised, and would furnish an aggregate equal to the last named figure. This great force of water-power is likely to be thrown altogether into the shade by the proposed plans to utilise Niagara, by placing three turbines, 4ft. in diameter, with 80ft. of head fed by a tube 7ft. in diameter, each turbine giving 1,000 horse power, with the whole strength of the great lakes and the Niagara River to reinforce them. The average flow of the river above the falls is 10,000,000 cubic feet per minute. Converting this into horse power under a head of 200ft., a grand aggregate is obtained of 3,000,000 horse power—a mighty force sufficient to supply the economic wants of 200,000,000 people.

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A number of gentlemen propose the holding of an Exhibition of all nations at Manchester next year. It is suggested that the interval of 20 years since the last great Exhibition of Art and Industry in London is long enough for such changes and progress to have been made as would justify an exposition of them in England, and that Manchester might fairly be the place for it, as being the centre of a more populous district than any other,—a district with greater variety of productions and manufactures than any other, and easy of access by way of Liverpool from the most distant parts of the world. The experience of previous Exhibitions is said to warrant the belief that Manchester and the northern manufacturing towns would gain greatly in immediate and permanent prosperity from an Exhibition attracting millions of visitors, and that the profits of the Exhibition itself could be well applied in the establishment of a Museum of Arts, similar to the South Kensington Institution, but adapted to local requirements.

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General patent laws have been lately passed and promulgated in Turkey and Liberia. The Turkish patent law is substantially a copy of the French and German systems. Any person may take a patent on deposit of drawings and specifications. Longest term of the patent fifteen years, annual tax 18 dols. The invention must be worked within two years from the date of the patent. The penalties for infringement and the proceedings are the same as in European countries. In Liberia the patentee must be the inventor, or must have lawfully acquired the invention from the inventor. Drawings and specifications must be furnished. The Government fee is 50 dols. The invention must be worked within three years after the grant of the patent.

THE GAZETTE.

Adjudications of Bankruptcy.

Derosa, Julia and Carl Muller, trading as Derosa and Muller, 19, Hanson Crescent, New Cannon Street, Manchester, commission agents, exporters and importers.

White, Greenwood, trading as Greenwood White and Co., Hewenden mills, near Bingley, stuff manufacturer.

Liquidations by Arrangement or Composition.

Bateman, Daniel, trading as D. Bateman and Sons, Low Moor, and Folly Hall Mills, Wibsey, Yorks., card maker.

Burrows, Alfred, Mary Gate and Plantagenet Street, Nottingham, lace manufacturer.

Hall, Tom, and James Edward Dyson, Providence Mills, Marsh, and Market Street, both of Huddersfield, woollen cloth manufacturers.

Bowring, James Richard, Royal Chambers, Wellington Street, Hull, wool merchants (sep. creditors).

Harrop, James, Bell Street, Oldham, cotton waste dealer.

Knowles, Reuben, Allerton, near Bradford, Brook Street, Bradford, and Grosvenor Street, London Road, Manchester, skirt manufacturer.

Peace, William and Benjamin Peace, trading as William Peace and Son, Abbey Lane, Shepley and Exchange, Huddersfield, woollen manufacturers.

Pinder, George, Banks and James Richard Bowring, Royal Chambers, Wellington Street, Hull, wool merchants.

Robinson, George Henry, Morley, Yorks., dyer.

Simmonds, Judah Lee, trading as J. L. Simmonds and Co., 16, Fish-street-hill, merchant.

Lund, George, Bolton Road, Bradford, and Bishop Street, Manningham, woollen merchant.

Musgrave, William, School Close, Leeds, Yorks., dyer.

Smith, John, Starkey Street, Heywood, Lancashire, dyer.

Woodcock, Exley, trading as Exley Woodcock and Co., Eleanor Street and Leeds Road, Huddersfield, dyer.

Sequestrations.

Macgill, David, 25, Gordon Street, Glasgow, dress and shirt merchant.

Rankine, A. and Co., Dalmarnock Dye Works, Glasgow, as a company, and Andrew Rankine, sole partner and as an individual.

Trustees Appointed.

Astin, Greenwood (Liquidation), Bradford, dyer and finisher. Trustee, G. Clay, Halifax, accountant.

Barton, Thomas and Adam Ferguson, jun., trading as T. Barton and Co. (Liquidation), Carter Street, Greenheys, Manchester, agents. Trustee, W. Pearson, Heywood, cotton spinner, and J. Hardcastle, Greek Street, Albert Street, Manchester, yarn agent.

Longworth, Edward, trading as E. Longworth and Co. (Liquidation), Deighton near Huddersfield, and Thurstone, woollen manufacturers. Trustee, W. H. Armitage, Huddersfield, accountant.

Ogden, Thomas and William Lumb (Liquidation), Myrtholmroyd, Yorks., worsted spinners. Trustee, J. A. Thwaite, Halifax, woolstapler.

Wiley, Arthur J. and Edwin Rowley (Liquidation), Huddersfield, woollen manufacturers. Trustee W. O. Clough, Huddersfield, accountant.

Powell, George (Liquidation), George Street, Richmond, upholdsterer. Trustee, G. H. Ladbury, 99, Cheapside, accountant, and B. Wood, George Street, Richmond, auctioneer.

Grellet, Albert, John Kupli, and Robert D. Meuron, trading as Grellet, Kupli, and Co. (Bankrupt), Fenchurch Street, general merchants. Trustee, J. Waddell, 1, Queen Victoria Street.

Hockey, William (Liquidation), Montacute, Somerset, flax dealer. Trustee, T. I. Denman, Yeovil, accountant.

Sutcliffe, John, and William Brearley (Liquidation), Halifax, dyers. Trustee, J. S. Lees Halifax, accountant.

Sutcliffe, John (Liquidation), Halifax, dyer (separate estate). Trustee, J. S. Lees, Halifax, accountant.

Tantum, Arthur, trading as A. Tantum and Co. (Liquidation), Nottingham, lace manufacturer. Trustee, W. F. Rest, Nottingham, lace manufacturer.

Brearley, William (Liquidation), Halifax, dyer (separate estate). Trustee, J. S. Lees, Halifax, accountant.

Dividends.

Berry, Titus, and Joseph Berry, trading as Titus Berry and Son (Liquidation), Cleckheaton and Rushworth, Yorkshire, flannel manufacturers. 1st dividend 2s.; J. Firth, Northgate, Cleckheaton.

Baxter, Robert M (Liquidation), Skinner Lane Dye Works, Leeds, dyer. 2nd and final dividend 3d.; I. Senior, 30, East Parade, Leeds.

D'Arcy, Henry E. A., trading as Henry D'Arcy and Co. (Bankrupt), Well Street, Cripplegate, and Coburg Road, Old Kent Road, late Noble Street, previous Wood Street, Cheapside, manufacturer. 1st and final dividend 3½d.; any Friday between 11 and 1; W. E. Pearse, 4A, Cheapside.

Nield, Mark, trading as Mark Nield and Son (Liquidation), London Wall, London, and North Parade, Manchester, merchant, and Oldham, cotton spinner. 2nd dividend 2s.; Handley and Wilde, 52, Brown Street, Manchester.

Heap, John, and Thomas Heap, trading as Heap Brothers (Liquidauion), Miln Row, Rochdale, woollen manufacturers. 1st and final dividend 9s. 5½d.; J Hoyle, Wardleworth Cottage, Rochdale.

Murfitt, Tom (Liquidation), Thornton Road, Bradford, and Hipperholme, Halifax, woolstapler. 1st and final dividend 6s. 8d.; W. M. Gray, Kirkgate, Bradford.

Musgrave, Henry (Liquidation), Sowerby Bridge, Halifax, woollen manufacturer. Trustee, W. Dufton, Leeds, accountant.

Wood, William H., trading as G. F. Peel and Co. (Liquidation), Bradford, stuff merchant, and 18, Little Britain, London, skirt manufacturer. 2nd and final dividend 1⅞d.; B. Musgrave, Bradford, accountant.

Bills of Sale.

Barlow John, and Samuel Hilton, Red Lumb Mills, Wolstenholme, near Rochdale, Lancashire, cotton spinners; for £1842 11s., to John Tatham.

Shepherd, Aaron, Brunel House, Gaythorne Street, Great Horton, and the Industrial Dyeing and Finishing Works, Gordon Street, Bowling, Bradford, dyer and finisher; for £1000, to James E. Townend.

Williams, William, 9, Grosvenor Street, Piccadilly, Manchester, and 23, Douglas Avenue, Hulton Street, Trafford Road, Salford, shirt manufacturer; for £200, to John Farnell.

Woodcock, Exley, trading as Exley Woodcock and Co., Lane Dye Works, Leeds Road, Huddersfield, indigo dyer; for £277 8s., to William P. England and another.

Woodcock, Exley, 8, Eleanor Street, Huddersfield, dyer; for £80 2s. 1d. to John Woodcock.

Wrigley, John, 70, Albert Street, Eccles, Lancashire, manufacturer; for £30, to Edward Hobson.

Blackburn, James, Summerland Terrace, Wakefield Road, Sowerby Bridge, woollen manufacturer; for £35, to John Woolfe.

Butterworth, Abraham, Wall Hill Bottom, Saddleworth, woollen spinner; for £15, to Alfred W. Lawton.

Farrer, William Thompson, 11, Bowker Street, Higher Broughton, Manchester, yarn agent; for £66, to York and Lanc. &c. Bank.

Wright, George, 6, Collinson Street, Alfreton Road, Nottingham, lace manufacturer; for £100, to Henry Taylor, junr.

Booth, George, 31, Weymouth Terrace, Southampton, upholsterer; for £18 18s., to Joseph J. Plowman.

Brunsden, George, 11, The Parade, East Dulwich, upholsterer; for £40, to London Commercial Credit Company.

Clarke, John Hope, Larkhill House, Stockport, cotton-broker; for £250, to Thomas R. Duke and another.

Harthan, Thomas, 129, Green-gate Street and 103, King Street, Oldham, silk-broker, and Julia Harthan of same address, baby-linen manufacturer; for £21, to Isaac Fineberg.
King, Jared, 46, Willow Street, Girlington, Bradford, machine wool-comber; for £230, to W. Milnes.
Wilkinson, Robert, Perseverance Street, Primrose Hill, Huddersfield, dyer; for £7, to Henry Simpson.

Dissolution of Partnerships.

Forrest and Brayshaw, Rawdon and Leeds, cloth manufacturers. Debts by William Croit Forrest.
Lupton and May, Aldersgate Street, frilling manufacturers. Debts by Peter John Lupton.
Merrifield, Milligan and Co., Brown's Buildings, Liverpool, cotton commission merchants. As regards John Milligan.
Miller, Son and Torrance, 21, Cannon Street, London, Glasgow, and Belfast, muslin warehousemen. As regards Andrew Miller.
Street and Co., King Street, Manchester, yarn commission agents. Debts by Arthur Spencer Kemplay.
Tidcombe, G. and Son. Watford, millwrights.
White, Isaac, and Sons, Quebec Terrace, Thornton Road, Bradford, wool and waste dealers. Debts by Edwin White.
Miller, Son and Torrance, Cannon Street, London, Glasgow, and Belfast, muslin warehousemen. As regards Andrew Miller.
Whyte and Matthew, India Buildings, Dundee, merchants, &c. Debts by Henry Whyte.
Mackie, W. S. and Co., Tongue Street, Manchester, costume manufacturers. Debts by Thomas Lomas Murgatroyd.
Simpson, A. and P., Hartford Mills, Preston, cotton spinners.
Wallace, William and Son, Burnbank East, Glasgow, bleachers, &c.
Gregory, Thomsons and Co., Kilmarnock, carpet manufacturers, &c. As regards Robert and William Railton, and Thomas Cuthbertson, senior and junior, and the trustees of Thomas Biggart.

PATENTS.

Applications for Letters Patent.

3765. Felix Robertson Lanier, Memphis, Tennessee, United States of America, temporarily of Liverpool, cotton planter, "Improvements in preserving cotton seed and cotton seed kernels and meal, and in treating the same to obtain valuable products therefrom."
3784. Edward Grube, Bury, engineer, "Improvements in shedding apparatus for looms."
3789. Charles Alfred Barlow, of the firm of Henry Bernoulli Barlow, Manchester, patent agent, "An improved machine for stentering, stretching, and drying fabrics."—A communication.
3794. Justus Wolff, 181, Chapel Street, Salford, consulting chemist, "Improvements in dyeing and printing textile fabrics and fibrous materials."
3800. Joseph Rogers Oldham, Sunderland, "Improvements in steam boilers."
3801. John Chisholm, Oldham, machinist, and John Glegg, of the same place, "Improvements in mules for Spinning."
3814. Edward Kenworthy Dutton and Joseph Holding, Manchester, "Improvements in and in connection with loom pickers and in the manufacture thereof."
3827. Charles Denton Abel, 28, Southampton Building, Chancery Lane, Middlesex, "Improvements in machinery for the manufacture of ruched, kilted, or pleated fabrics."—A communication.
3842. Samuel Tweedale, Accrington, foreman mechanic, "Improvements in shuttles for weaving."
3854. Benjamin Norton, of the firm of Norton Brothers and Company, Limited, Nortonthorpe, near Huddersfield, manufacturers, and Crossley Turner, of the same place, yarn manager, "Improvements in the method of and apparatus for making clouded flaked, or spotted yarn."
3855. William James Leopold Hollis, Gainsford Street, Surrey, engineer, "Improvements in lubricants."
3874. Elias Smethurst, Manchester, "Improvements in the construction of looms for weaving."
3900. John Sidney Crowley, Manchester, engineer and iron founder, "Improvements in loom shuttles."—A communication.
3892. John Henry Allin, of Edgeware Road, Middlesex, draper, "Improvements in ornamenting linoleum, kamptulicon, oil-cloth for covering floors, and other similar fabrics."
3896. William Lancaster, machine maker, Accrington, and Edward Slater, Burnley, "Certain improvements in machinery for spinning, doubling, and winding yarns."
3914. Walter Lord and Will Lord, of Todmorden, "Improvements in machines for preparing cotton and other fibre."
3918. Edward John Vavasour Earle, of Berners Street, Oxford Street, Midlesex, foreign goods importer, "An improved construction of case for the reception of embroidered and other trimmings, lace, and woven bands."
3919. Joshua Bardsley, manager for John Henry Garlside, 52, Fountain Street, Manchester, "Improvements in rollers used for the printing and treating of cloths, paper, and other fabrics."
3931. John Wolstenholme, Albert Works, Radcliffe, near Manchester, engineer, "Improvements in apparatus for wringing cotton, linen or other fibrous yarns when in the hank, dyed, sized, or otherwise."
3935. Isaac Buckley and Edwin Crossley, Dukinfield, "Improvements in machinery or apparatus for spinning and doubling cotton and other fibrous materials."
3949. William Currie, Belfast, "Improvements in and in apparatus for oiling the shafting, spindles, and other moving parts of spinning, roving, and other machinery."
3988. Frank Wirth, of the firm of Wirth and Company, patent solicitors, Frankfort-on-the-Maine, Germany, "Improvements in the manufacture of colouring matter."—A communication.
3996. Alfred Yates, Imperial Chambers, Derby, "Improvements in the twisting, doubling, or like manipulation of cotton or other fibrous materials, and in means of apparatus employed therein."
4014. Herbert Greg, of the firm of James Chadwick and Brother, Eagley Mills, Bolton, "New or improved means or apparatus for mounting crochet cotton, and other balls."
4015. William Mather, of the firm of Messieurs Mather and Platt, Salford Iron Works, Manchester, "Improvements in the manufacture of velvets and other pile fabrics."
4025. Richard Scott Collinge and Edward Collinge, Oldham, "Improvements in the manufacture of velvet."
4031. Fanny Mautsch née Lecocq, Termonde, Belgium, "New or improved skein or hank holder for balling or reeling skeins or hanks of cotton or silk and thread yarn or wool."
4047. Matthew Hilton, Parkside, Prestwich, Manchester, "Treating a certain plant or vegetable material, and applying the fibre obtained therefrom, and not before used for the purpose, for spinning into yarn or thread, cords or ropes, and for manufacturing cloth, and making felted fabrics or paper, and for other purposes, either alone or in combination with other fibres."
4056. John Erskine, Sion Mills, Strabane, Tyrone, Ireland, "Improvements in wet spinning frames."
4068. Herbert John Haddan, Kensington, Middlesex, "Improvements in or applicable to carding machines."—A communication.
4071. Thomas Bottomley, Buttershaw, Bradford, "Improvements in the manufacture of leno or gauze cloth."
4072. Frederick Albert Gatty, Accrington, "Improvements in the manufacture of coloured sized yarns."
4074. James Francis Wanner, Mortimer Street, Middlesex Hospital, Middlesex, embroiderer, "An improved ornamental fabric applicable to the manufacture of skirts, mantles, coverlets, cushions, and other articles of dress and upholstery."
4097. Joseph Sellers, Scholes, "Improvements in the method of and apparatus for making cards."
4105. Rudolph Spöndlin, Zürich, Switzerland, "Improvements in the method of winding thread on cop-tubes, or spools, and in mechanism therefor."—A communication.
4112. John William Stringer, Bradford, mélange printer, "Improvements in printing colours on fibres and fibrous substances."
4125. John Frederic Harrison, Bradford, commission wool comber, "Improvements in combing wool and other fibres, and in the machinery therefor."
4129. John Bastow, Bradford, spinner, "Improvements in apparatus for spinning, doubling, and preparing cotton, wool, flax, silk, or other fibres."
4131. William Cullen Horne, Bexley, "Improvements in the manufacture or treatment of lace curtains and other analogous or similar articles."
4140. Thomas Howard Blamires, Huddersfield, woollen spinner and manufacturer, "Improvements in mules for spinning wool, cotton, and other fibres."
4143. Joseph Renals, Bread Street, London, "Improvements in the production of embroidery."—A communication.
4179. John Beard, Ashton-under-Lyne, "Improvements in carding engines."
4180. Charles Wilden King, Manchester, engineer, "Improvements in steam-boilers, their fire-places, and combustion chambers."
4206. Thomas West Walker, Hanley, "Improvements in apparatus to be used in the washing of clothes and fabrics."
4215. William Henry McNary, Brooklyn, New York, "Improvements in knitting machinery and in the production thereby of knitted fabrics of a novel character."
4216. Edward Leonard, Philadelphia, Pennsylvania, United States, civil engineer, "Improvements in apparatus for the protection of factories, mills, warehouses, and other buildings against fire."
4233. Herbert John Haddan, Kensington, Middlesex, "Improvements in apparatus for weighing wool."—A communication.
4251. Frederick Versmann, Ph. D., consulting chemist, New Charlton, Kent, "Improvements in the manufacture of floor-cloth."
4258. William Ashworth, 42, Crowther Street, Burnley, mechanic, "Improvements in looms for weaving."
4272. John McNaught and William McNaught, junior, St. George's Foundry, Rochdale, engineers, "Improvements in machinery for scouring and washing wool and other fibrous materials."
4275. Joseph Linington Rastrick, Draper's Gardens, Throgmorton Street, London, "Improvements in steam-boilers."

Grants of Provisional Protection for Six Months.

2980.	3348.	3522.	3524.	3598.	3610.	3605.	3627.
3631.	3673.	3709.	3717.	3723.	3735.	3743.	3765.
3789.	3801.	3809.	3262.	3919.	3931.	3935.	3949.

Notices to Proceed.

1855.	1878.	1931.	2516.	3397.	3603.	1881.	1921.
1932.	2868.	3462.	2221.	3522.	3605.	2095.	2266.
2062.	2099.	2108.	2360.	2925.	3590.	3723.	2194.
2195.	2748.	2005.	2313.	2296.	2481.	3243.	2434.

Patents on which the Stamp Duty of £50 has been Paid.

4038. Walter Willson Cobbett, 8, Conduit Vale, Greenwich, "Improvements in the manufacture of woven driving belts or bands."—A communication.
3467. James Tinker, Holmfirth, designer, "Improvements in jacquard machinery employed in looms for weaving"
3586. John Harrison, Liverpool, "Improvements in and appertaining to valves for steam and other motive-power engines."
1248. John Newton, Kimberley, Nottingham, "Improvements in machinery and apparatus applicable to twist lace machines to produce combination, swiss, and embroidered coloured fabrics."
3735. Patrick Kelly, Sutton Mills, Crosshills, York, overlooker, "Improvements in the method of and apparatus for the preparation of long and short wool."
3822. Walter Alfred Barlow. 6, St. Paul's Churchyard, London patent agent and engineer, "Improvements in process for applying chineeing by dyeing to slivers of combed or carded fibrous substances before spinning the same."—A communication.
3891. John Lumsden Nelson, Aberdeen, North Britain, "Improvements in the manufacture of combs, and in the machinery or apparatus employed therein."
3902. William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in spindles and their bearings for spinning machinery."—A communication.

Patents on which the Stamp Duty of £100 has been Paid

3263. Andrew Hislop Maclean, Greenwood, Argyll, North Britain, "Improvements in apparatus for feeding wool, cotton, or other fibrous materials to carding or other machines."
3338. Thomas Bradford, 142 and 143, High Holborn, Middlesex, and Manchester, laundry engineer, "Improvements in machinery or apparatus for washing, wringing, and mangling."

Patents Sealed.

1057. Christopher Catlow, Burnley, overlooker, "Improvements in looms for weaving."
1077. James Slimon, Kirkintilloch, Dumbarton, and John Whyte, Glasgow, "Improvements in or connected with looms for weaving."
1455. James Wood, Bingley, stuff manufacturer, "Improvements in looms for weaving, and in apparatus connected therewith."
2947. William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in machinery for cleaning and opening fibrous materials."—A communication.
1029. Frederick Mills, Heywood, machine maker, "Improvements in machinery for carding cotton and other fibrous materials."
1067. Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in apparatus for breaking or preventing 'double twist' in spinning."—A communication.
1282. Charles Wilden King, Manchester, "Improvements in steam-boilers, their fire-places and combustion chambers."
2660 Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in apparatus for feeding fibrous material to carding engines and other machines."—A communication.
1337. William Priestley, of the firm of Briggs, Priestley and Company, Laisterdyke, Bradford, manufacturer, and William Deighton, of the same place, foreman mechanic, "Improvements in looms for weaving."
1347. Joseph Midgley, Bradford, machine maker, "Improvements in machinery for combing wool and other fibrous substances."
1678. Joseph Hacking Riley, Bury, Lancaster, "Improvements in machinery or apparatus for removing vegetable fibre from woollen fabrics."
1612. James Priestley, Frederick Priestley, overlookers, and George Priestley, manufacturer, Bradford, "Certain improvements in power looms, and in apparatus connected therewith, for weaving and cutting plush, velvets, seal skins, and other piled fabrics."
3295. Thomas Lawson, Leeds, machine maker, "Improvements in machinery for spinning yarns from flax, hemp, and other fibres."
1465. George Bodden, Oldham, "Improvements in the construction of apparatus used in spinning and doubling cotton and other fibrous substances."
1657. Walter Thacker, Nottingham, "Improvements in the manufacture of fabrics in knitting and other machinery employed in the manufacture of knitted or looped fabrics, and in machinery or apparatus employed therein."
1811. William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "An improved process or method of treating vegetable textile materials, chiefly designed to facilitate the dyeing of the same."—A communication.
1521. Joseph Lomax, shuttle manufacturer, and Richard Dawson, foreman shuttle maker, Over Darwen, Lancaster, "Improvements in shuttles for weaving, parts of which improvements are applicable to other uses."
1075. David Butterfield, Keighley, iron and brass founder, "Improvements in the construction and manufacture of caps employed in spinning."
1111. John Hawthorn, John Pemberton Liddell, and Peter Hawthorn, of the firm of John Hawthorn and Co., Newtown, of Chester, engineers, "Improvements in expanding rollers or apparatus for stretching fabrics."
2485. Prince Smith, the younger, Keighley, machine maker, and Smith Ambler, Keighley, draftsman, "Improvements in spinning and twisting machinery."
3019. William Richardson Moss, Bolton, "Improvements in machinery for combing cotton and other fibrous substances."
1502. George Crosland Taylor, Huddersfield, manufacturer, "Improved means of preparing warps for weaving, and in the methods or processes of and apparatus employed in such preparation."
3161. Herbert John Haddan, Kensington, Middlesex, "Improvements in looms for weaving."—A communication.
1255. Robert Ritchie, and John Ferguson, Cordale Print Works, Dumbarton, "Improvements in apparatus for printing woven and other fabrics."
1485. George Tall and John Daddy, Kingston-upon-Hull, "An improved manufacture of a compound for preventing the escape of steam, gas, water, or air from joints of engines, boilers, pipes, and machinery."
1418. William Strang, Glasgow, Lanark, North Britain, manufacturer, "Improvements in weaving ornamental fabrics, and in looms therefor."
1479. Henry Bernoulli Barlow, Manchester, wire heald maker, "Improvements in the method of and machinery for making wire healds and jacquard harness."
1498. Robert Kerr, Paisley, Renfrew, North Britain, manufacturer, "Improvements in cabinets or cases for containing assortments of thread, spools, or bobbins, or similar articles."
1686. Henry Harris Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in the manufacture of proteine substances to be used more especially in calico printing."—A communication.
1490. William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, for an invention of "The manufacture of an improved fibrous material from a vegetable production."—A communication.
1492. Herbert Anderton Foster, Queensbury, Yorks., spinner and manufacturer, "Improvements in looms for weaving."
2952. L. A. Groth and Co., 97, Finsbury Pavement, London, E.C., "New or improved process for preparing textile materials with chemical solutions of silk, wool, or feather down or mixtures thereof."—A communication.
3091. Thomas Richards Harding and Thomas Walter Harding, Leeds, hackle pin and comb manufacturers, "Improvements in fluid meters."
2632. Norman Fraser, of the firm of Douglas, Fraser and Sons, Arbroath, Forfar, North Britain, manufacturers, "Improvements in plaiting fibrous or other flexible materials, such as strands, threads, yarns, slivers, bands, or wires, and in machinery therefor."

Copyright of Designs.

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Class VI., Carpets.

369,040. John E. Barton, Kidderminster.
369,177-89. James Williamson and Son, Lancaster.
362,223. James Humphries and Sons, Kidderminster.
369,592. A. F. Stoddard and Co., Elderslie, N.B.
369,815. James Humphries & Sons, Kidderminster.
369,988-370,000. The Heckmondwike Manufacturing Company (Limited), Heckmondwike, Yorkshire.
370,348-69. Cooke, Sons and Co., London and Liversedge, Yorkshire.
370,637-38. The Heckmondwike Manufacturing Company (Limited), Heckmondwike, Yorkshire.
370,689-98. Thomas Bond Worth, Severn Valley Mills, Stourport.

Class XI., Furnitures.

369,449. Boden, Terras and Co., of Manchester.
369,452-53. Salis Schwabe and Co., 41, George Street, Manchester.
369,454. R. Dalglish, Falconer and Co., Manchester and Glasgow.
369,520-21. Daniel Lee and Co., Fountain Street, Manchester.
369,530. B. Duckworth and Sons, 16, Turner Street, Manchester.
368,590. R. Dalglish, Falconer and Co., Manchester and Glasgow.
369,651. Daniel Lee and Co., Fountain Street, Manchester.
369,665-72. Stead, McAlpin and Co., Cummersdale, Carlisle.
369,730. Thomas G. Hill and Co., 86, Major Street, Manchester.
369,772. F. W. Grafton and Co., 91, Portland Street, Manchester.
369,773. Daniel Lee and Co., Fountain Street, Manchester.
369,775-77. R. Dalglish, Falconer and Co., Manchester and Glasgow.
369 824. Salis Schwabe and Co., 41, George Street, Manchester.
369,825. E. M. Stoehr and Co., 76, Newton Street, Dale Street, Manchester.
369,916-20. The Rosendale Printing Company, Manchester.
370,024. Thomas Hoyle and Sons (Limited), Manchester.
370,344. R. Dalglish, Falconer and Co., Manchester and Glasgow.
370,345. Boden, Terras and Co., Manchester.
370,388. Daniel Lee and Co., Fountain Street, Manchester.
370,598. Daniel Lee and Co., Fountain Street, Manchester.
370,613. Beith, Stephenson and Co., 14, Bridge Street, Manchester.
370,621. Daniel Lee and Co., Fountain Street, Manchester.

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Art applied to Textile Fabrics.

BY LEWIS F. DAY.

THE first consideration in the design of Textile Fabrics, and indeed almost the only one, is colour. That being said, we must allow that colour is not, and can never be, altogether independent of form; therein lies the excuse for the ungainliness of many of the Chinese forms of ornament, that they are simply boundaries of colour-masses, and if the colour be fine they are justified. It would be but a logical deduction from this argument to declare that design is therefore unnecessary, and that simple materials of good colour are enough. And the truth is that when we depart from simple cloths, velvets, damasks and plushes for curtain materials, we depart in many instances from simplicity and beauty alike, putting ourselves to more pains in order to accomplish less in the way of art than the weaver of more modest pretensions. But there is monotony in one-tinted materials against which the artist instinct rebels; and it certainly is possible to produce in fabrics, in which a multiplicity of colours are interwoven, an effect of colour more beautiful than it is possible to get out of the warp and woof of threads that came out of the same dye-pot. The important thing to bear in mind is that the effect should bear strict relation to the multitude of colours employed. If we go to greater expense in production—(more elaborate design, more cost in the cards, more variety of colour)—we ought certainly to produce results more beautiful in proportion to our pains. Else we convict ourselves of wastefulness; and in art waste is as much to be condemned as in ethics.

The secret of beautiful colour lies, we know, in variety. The charm of the marble inlays that one meets with all over Italy is due, more than to anything else, to the infinite variety of marbles; no two pieces are exactly alike, and each is in itself most varied. It is just the same with the old mosaics; the tesseræ vary in shade, all the more on account of their irregularity, and the different angles at which they are set, just as the colour of a carpet or a velvet varies according to the angle at which the pile catches the light. In fabrics woven in the East we see very distinctly the use that may be made of variety. In an ordinary Persian rug, for example, when the pattern is in bright colours on a dark ground, that ground is in parts black, in parts dark blue, in parts perhaps almost brown, one shuttle having apparently been used after the other just as they came, without any idea of absolute uniformity of tint. It is that love of uniformity which is the bane of modern British manufacture; it is just that which divides it off by a hard line from the region of art.

It may be urged that there is a limit to such variation in weaving, and that the variations must, after all, unless they are to entail expense, take a horizontal direction. That is in a measure true. Yet even within the limits of cards that allow only for three or four colours, very considerable variety is possible, without taking into account the tints that a clever weaver can get by crossing or intermingling threads. Suppose a curtain in which the pattern consists of a leaf-scroll in green, on a ground of ruby, with flowers of pale red, the ruby ground might vary from brown to purple, the scroll from citron to blue green, the flowers from apricot to rose colour. That is to say, instead of one ruby, one green, and one pink, with which it is difficult to produce anything but a harsh and mechanical result, the weaver might have entrusted to him half-a-dozen shades of each to use indiscriminately, just as they came to hand, by which means he could not but produce an effect infinitely more artistic than would be possible by the more mechanical process we adopt.

True it would be better still if the British workman, like the oriental, had some sense of colour to direct him, or some traditions to go by; but even as it is we might do much better things than we do, if only we had less infatuation for uniformity.

In applying this method to carpet weaving there would be the objection that the breadths of the carpet, when laid, would not match in colour, and would therefore assert themselves—an objection which in British eyes is no doubt insuperable. But in curtains which are made of the full width this objection would not occur. If here and there a horizontal stripe were apparent, that would be no fault in a curtain meant to fall in perpendicular folds; and my own belief is that, unless the variation were too sudden, the ordinary purchaser would not know that the variation existed, any more than he is aware of it in his Persian rug; he would just feel that the colour was somehow softer and richer—that is all.

In reference to the horizontal stripe (that *might* occur but *need* not), I have often wondered how it is that the English mind "shies," so too speak, at the idea of a horizontal stripe in curtains, all the more that perpendicular stripes were so long in favour with us It occurred to me once to endeavour to circumvent this prejudice, by designing a curtain in which the stripe was not definitely marked, but where the flowers ranged themselves at intervals into horizontal bands not very conspicuous among the foliage. But, though this was produced, it was not, I was told, a successful pattern in the market Yet there is a sale for striped materials of Eastern origin, and they appear to be in the favour they richly deserve. If any line at all is to be evident in a curtain, it is just a horizontal one that is in place. It marks the folds in which the material falls, and enables you to realise its fulness, whilst all harshness of effect in it is obviated by those same folds: you never see the long horizontal line, but only a succession of curves. Perhaps the objection to it is in the spread-out form in which it is exhibited for sale—just as those wall papers sell best which look prettiest in the pattern-book, not those which hang best on the wall.

(To be continued.)

According to reports received from across the Atlantic, our cousins seem to be doing an enormous trade in carpets. We are happy to state on reliable authority that they are not alone in their prosperity in this branch of industry. The firm of John Crossley and Co., Limited, of Halifax, have for the past four months been working in the Brussels department until 9 p.m., but in consequence of complaints from the workmen of the long hours, they have reduced the overtime one hour. The Tapestry weavers have also made full time for many months. American merchants trading in carpets, have recently visited the firms in Halifax, Kidderminster, &c., engaged in the business.

THE FRENCH TREATY.

Probably no subject within the last quarter of a century has been the burden of so many *on dits* and contradictory rumours as has the Treaty which is supposed to be at the present time in process of incubation. Several times within the twenty-four hours, technically called a day, has it been asserted at one moment that all was going well; and, at another, that insurmountable difficulties had arisen. Next we are informed that the Treaties are on the point of being signed with Italy and Spain, and shortly after it is officially announced that only a prolongation of the existing treaties with those countries for three months has been signed. A leading English daily publishes its Paris correspondent's letter, wherein it is declared that it is "all up" with the negociations in Paris, the Commissioners returning on Saturday (the 6th inst,) "and there will be no treaty." Then a little amateur prophesying is indulged in, and M. Léon Say is to be the new Minister of Finance, and M. Maurice Rouvier the new Minister of Commerce, both of whom are comparative free-traders. In the same day's issue of an English Ministerialist paper we are gravely told that whoever is left out of the next ministry M. Tirard is the one who *cannot* be spared!! In the midst of all these bewildering statements and contradictions the ordinary reader becomes puzzled, and, if engaged in a business more or less depending on French trade, he will, if he does not mind, become literally distracted.

At this point a very grave question indeed arises:—What is the effect of all this on present trade, and what will be its effect on future trade? The full and correct answer to this serious question is not so easy to give, but common sense plainly tells us that it cannot but be injurious, if only because uncertainty in such affairs almost always leads to wild and unhealthy speculation. It is to this spirit of speculation, in fact, that a good deal of the business now in hand in certain parts of this country largely owes its existence. The uncertainty as to the form the Treaty may ultimately assume, and the doubt as to the execution of a treaty at all, compel those in France who are dependent on this country for semi-raw material and heavy finished goods, to look beforehand for their future supplies, and so they are induced to lay in as much stock as they possibly can, to the great damage of future trade through overstocking.

Looking at the whole question in as broad a light as possible, there is certainly much to disquiet the mind of the commercial world, but especially that portion of it which we denominate the textile trades. They, in fact, or rather their interests, have proved to be the *crux* in this ponderous question, and, indeed, it is but natural that it should be so, when it is seen that out of £223,060,446 of exports of British produce in 1880, the textile trades reckoned for £110,854,467. Not that a tenth of this went to France, but whatever conditions we accord to France, we are bound to concede to every other nation with whom we stand on the most favoured nation footing. Germany, for instance, buys more from us than France; therefore the conditions we set up between ourselves and the latter country will determine our future relations, commercially, with Germany; and so on all round, *cetæris paribus*. Unquestionably the most difficult point in the negociations is that of the specific duties; and, without indulging in any needless recriminations, it is impossible too much to object to them in regard to their proposed application to the various textiles, but most of all in regard to woollens. It seems almost like thrashing a dead horse to urge this point at the present moment, when the negociations have already entered on another period of disruption, and when, in addition, the new Treaty between France, Italy, and Belgium has been signed in such a form as to admit specific duties on everything. But we are as certain as of our present existence that France will not let us be without a treaty for long, if even events should so happen that we are treated to a taste of the New General Tariff. The difficulties France had in 1878 with Italy, Spain, and Austria over the renewal of their Treaties indicate pretty clearly what France will do if we finally break off negociations without signing a Treaty. She was glad to make the *amende honorable* to those countries in a few weeks, although the Protectionist *furore* in France was then more vigorous than now. But what is all the business done with France together by these three countries compared with that which France does with us? We took of French domestic produce in 1879 £34 400,000, and this was a very poor year, while Italy, Spain, and Austria took unitedly but £14,040,000! In view of this fact we can calmly await the return of the French to reason, and the more so because what they take of British produce only amounts to less than half of what we take of French produce. All the same, however, we do earnestly hope that better counsels will prevail, and that the French will not impose on themselves any needless suffering, nor on us any needless inconvenience, such as will be caused by a total rupture. Because not only will such results surely follow an entire suspension of negociations, but such a suspension would most probably be followed in turn by at present unforeseen commercial difficulties in both countries; and also, and equally likely, would it be followed by political consequences the gravity of which it is impossible at present to estimate.

Asbestos Curtains.

It is somewhat surprising that Asbestos, a mineral having for its principal constituents silica and magnesia, should have been put to such a variety of uses. The fibre of Asbetos differs from other fibre in having a perfectly smooth surface, in consequence of which all efforts to spin and weave it by modern machinery have, until recently, failed. This long lost art of spinning and weaving has however been restored during the past few years, and yarns and plaited ropes are now largely made from the Asbestos. Cloth was formerly made by the ancients from the fibre, and used in the preservation of the dead. At present similar cloth is made, and used by chemists for filtering acids. But a new use has been found for it Mr. John Bell, the manufacturer of various Asbestos articles, whose works are in Southwark Street, London, has lately succeeded in making a cloth suitable for curtains, indestructible by fire. Mr. L. Will, Mr. Bell's representative in Scotland, conducted an experiment in Glasgow last month, which was witnessed by a number of gentlemen, including representatives of Scotch and English insurance companies. A curtain, nine yards square, was exposed to fire nearly forty minutes, without having even its colour affected, and not at all injuring its tensile strength. The result gave great satisfaction, and afforded evidence that cloth of this description is a valuable material, calculated to be of great use in protecting life and property in cases of fire. A piece of the material has been sent to us, which we have tested in the above manner, the result being satisfactory. There is no doubt that the use of Asbestos is as yet only in its infancy, and it may safely be predicted that a fibre which resists in so very remarkable a degree the action of heat, will before long be made to serve an infinite number of purposes.

The Manufacture of Tapestry.

The wonderful development of the tapestry trade is one of the marvels of our modern textile manufactures. Until recently French manufacturers had the best of the trade in high class productions, the colouring especially of their fabrics being far above anything produced in this country. It should be a matter of no small congratulation that we are not now compelled to go abroad for the choicest things in such productions. We are glad to note that some of the materials now being produced by some of our leading manufacturers must commaud the highest admiration from practical men, and the public generally. It is only recently that French manufacturers were complaining of the falling off in their tapestry business, attributing the state of things to the rapid strides made by English manufacturers through the employment of French designers. But whatever the cause the fact undoubtedly remains that, for balance of colour, beauty of design, and brilliancy of finish, the fabrics now being produced by some of our manufacturers are of such an artistic nature that they cannot fail to satisfy the most fastidious purchaser.

OUR TECHNICAL SCHOOLS.

The subject of Technical Education connected with our Textile Manufactures, has for years occupied the minds of many of our leading manufacturers. As far back as 1872 Mr. John Watson in his work on "The Art of Weaving" said—"The continental nations have been making strong efforts to compete with Great Britain in the manufacture of Textile Fabrics. Indeed, many of our manufacturers think that we are losing ground for want of a proper system of education being given to our work-people—more especially a *Technical Education*—and there is not the least doubt that we are fast losing our position for want of that system of training, which France, Germany, and other nations have adopted." But long before this time, the want of Technical Education was apparent in all branches of industry. After the great Exhibition of 1851, the late Prince Albert recognised this want, and so strongly was he impressed with the necessity, that the realisation of this idea became one of his most cherished objects. It has been only, however, during the last three or four years, that any decided steps have been taken to meet the requirements of this great manufacturing nation. It is a question whether these steps have not been forced upon us by the rapid strides, which have been made by France and other continental nations. There is no doubt, that we have much to learn from our neighbours across the channel. The natural genius of the French artisans has always been encouraged by the Government, which has established Schools of Design, &c, and courses of gratuitous lectures for this class, upon different subjects applied to art and manufactures. In a recent speech by Henry Mitchell, Esq, (one of the principal Bradford merchants), he made use of the following words:—"The want of a careful and scientific training of our operatives in their respective industries is one cause of the decline of our trade. We have not kept abreast of other countries that have given a careful technical training to their artisans, which has enabled them to produce a higher class of goods. Some of the continental nations were a long way behind us twenty years ago, but they are now abreast of us, and in some senses ahead of us, and for that, they are largely indebted to their schools" We might multiply our extracts from the speeches of practical men upon this subject, but for the present will content ourselves with one more taken from a speech on Technical Education, by the President of Queen's College, Belfast:—"England is pre-eminently a manufacturing country. Her wealth and power are largely owing to her success in this department. If she would continue to prosper, she must preserve the superiority of her fabrics and successfully meet in the open market, the skill, taste and technical knowledge of all competitors. Hence the vital necessity to the nation at large, of Technical Education on a sound basis. It is the pressing want of the present time."

In many of our leading manufacturing cities and towns, Technical Institutes have been, or are being founded. Foremost amongst these may be mentioned "The City and Guilds of London Institute"; "The Manchester Technical Department of the Mechanics' Institute"; "The Glasgow Technical College"; "The Yorkshire College" at Leeds; and "The Bradford Technical School." The programme of technological examinations in connection with the first named of these institutes for the year 1881-2 has just been issued. It contains a number of new syllabuses of subjects, amongst which will be found—electric lighting and transmission of power; coal tar distillery and spirit rectification; the manufacture of linen; linen dyeing, bleaching and printing; weaving and pattern designing. It would be well for founders of new schools to follow the arrangements of this programme, as it contains one or two new and important features. The Manchester school provides instruction, in addition to other subjects, in cotton manufacture, dyeing, bleaching and calico printing; also in designing for calico printing. The Glasgow school is adding to its already comprehensive syllabus instruction in dyeing and calico printing. The Yorkshire College at Leeds, we noticed at some length in our last issue, but we may add that the Textile Industries Committee have decided to act on a recommendation of the instructor, Mr. Beaumont, to open the weaving shed to evening students, that department having hitherto only been open to day students. The new school in Bradford is to be opened in May next; in the meantime, classes are being held under the supervision of Mr. Ashenhurst, which are productive of much good. Macclesfield is not behind in its desire for improvement in its particular branch of industry. Classes have been formed for the dyeing and manufacturing of silk. Belfast, Preston, Huddersfield, and other towns are taking decided steps in a direction which cannot fail in attaining the desired end. The memorial stone of the new technical school at Huddersfield was laid last month by the Master of the Worshipful Company of Clothworkers, which company has contributed £2,000 towards the cost of the undertaking. There are some large manufacturing towns, however, which have not yet seen the necessity of running in "The Race." We trust the time is not far distant, when every manufacturing town in the kingdom will do its utmost, by founding technical schools and striving to make them successful, to maintain the character of Great Britain, as the greatest manufacturing nation in the world.

Countermands & Protections.

Every department of manufacturing industry would be greatly facilitated and its products cheapened if the sale of these was direct and certain in the first instance. The margin required to insure the sale is now unnecessarily large, and, in the end, the consumer pays the difference—a difference which need not be interposed, because it adds to the cost of almost everything without profiting the several hands through which the goods pass. In English trade the manufacturers are struggling with one form of this difficulty, namely, the forward dating of the obligation given by the first purchaser, a device which extends an ordinary four months' credit four or six months longer, and sometimes to a year. If the market is not sharp and active, the manufacturer has two risks to run, the one of piling up goods which may not after all be taken at paying prices, or the other of parting with his goods to a dealer for post-dated paper, which gives the dealer an opportunity to sell and realize their value months before he is required to pay for them. The opportunity for abuse is great, and, of course, the manufacturer must insure himself in the price he demands, or in some device for cheapening or evading to which he would not have been compelled to resort if he had sold for cash and a moderate profit.

In the United States a worse abuse exists, derived from the sharpness of the pressure on both manufacturers and dealers, occuring when prices fall rapidly and continuously on stocks, the materials for which were bought at high prices and on a rising market. These changes of price have been frequent and severe, especially during the last ten years, and, as a consequence, a practice of countermanding orders has been developed that has no legal or moral defence. It is the custom to order freely on a rising market, the dealers or commission houses then desiring to get everything possible into their hands, to profit by the quick sales and good profits then prevailing. Such was particularly the case, during the first four or five months of 1880, in the textile trades. Prices were high, and the whole production of the machinery in operation, say on May 1st, of that year, was, as a rule, ordered fully forty or sixty days ahead. But in June the demand slackened, and before the close of that month hundreds of countermands had been sent to the manufacturers by the dealers, practically repudiating their contracts, and leaving the manufacturers with large quantities of goods urgently ordered a few weeks previously, but afterwards refused. In these cases the cost of the materials and labour had advanced largely, and the manufacturer incurred unusual cost in preparing to make the goods ordered. In most cases the profit on goods ordered bore no equality to the risks taken in buying materials for higher prices and in paying the higher wages necessary in preparing the goods under pressure. Then, at a time intermediate between the order and

any possible delivery, the countermand was sent, and the great majority of the producers made no attempt to obtain redress. The reasons for submitting were various, but chiefly because some defence as to style or quality could be interposed which never would have been thought of if prices had not declined. Sometimes the lots ordered would be taken with an abatement, or reclamation for quality or style would be made in place of an absolute countermand—any way in short, being taken to throw the loss off on the part of the dealer, through whom alone the manufacturer could then dispose of his fabrics.

This outrageous and illegal practice, for it can be described in no milder language, is due to the violent and extreme changes in prices characteristics of the dry goods' markets, and to the defenceless position generally held by the manufacturers. But it is anomolous and inexcusable, and would not be tolerated in any other business. The facts fully told would be scarcely credible, and it is a mistake that the wide-spread injury resulting a year ago was not made the subject of a detailed exposure, and just condemnation of those who, while abundantly able to keep them, repudiated their obligations by wholesale.

Another practice in the dry goods' manufacturing trades has grown up, which, while not involving so much discredit as that of countermands, is still unfortunate to the manufacturer or commission house permitting it. It is termed the protection of goods sold, or the guaranty of the buyer against loss by subsequent decline in price. A merchant from a distant town takes an assortment of prints—ten to twenty cases or more—under a protection. The goods are at once delivered, and he reports them sold when he chooses, remitting the price prevailing when he sells them, not when sold to him. He may sell them at a higher price, and choose to report them later, when a lower price prevails, or when he has made a second profit by the second use of the money. The account is not closed until the buyer chooses, in short, and often the right to recall or transfer them is not reserved. In one case where such right was reserved and where it was suspected that an untrue report was made that none was sold, an order of transfer compelled the purchaser to pay for the whole at an advanced price, as he had, in fact, disposed of them. It is an objectionable practice to deliver goods not sold absolutely, and these protections originate in times of great depression, remaining to embarrass and demoralize trade after all occasion for them has passed away. At any rate the condition of dependence which compels the manufacturer to consign for any sale or any sacrifice has greatly changed for the better, and they will now be found better defended against eithre class of abuses than at any previous time.—*Bradsteets.*

Oriental Fabrics.

Messrs. W. and J. Sloane, the New York merchants, so well known amongst British manufacturers, have purchased at a cost of about £350, a magnificent prayer rug, which they are now exhibiting in their Turkish department in Broadway, New York. The rug has been procured with other interesting relics by their agent at Constantinople from the Summer palace of the late Sultan Abdul Aziz, whose assassination is still fresh in the public memory. This curious specimen of Oriental handiwork is of blue satin, elaborately wrought with gold and silver thread and surrounded with gold fringe. It is lined with pink silk, and is four feet six inches wide and six feet long. At the end intended to point toward the west, from which direction the devotee approaches the sacred object, the design represents the entrance to Biduktrach Palace, in Constantinople, the favorite Summer residence of the murdered Sultan. It was the custom of Abdul Aziz, on arising in the morning, to shoot birds with a bow and arrows, and to erect a marble pillar to mark the spot where any arrow fell which had not hit a bird. This custom resulted in the erection of six pillars—three on each side of the entrance to the palace—and these are represented in silver thread on the rug. The next part of the design is a representation in gold and silver thread, with windows in pure, burnished silver, of the Mosque of Kabatsh, adjoining the palace grounds, which was the Sultan's favourite place of worship, and in which he daily used this rug. Next come similar representations of two mosques situated in the palace park, behind the palace, one having been erected by the Sultan in honour of his mother, and the other in honour of his first wife, to whom he was married before ascending the throne. The figures described are interspersed with flowers and vines finely wrought in gold and silver thread.

Whilst speaking upon the subject of Oriental Fabrics, we here give a description of the Kelim carpets manufactured in Bulgaria. "These carpets," says an English writer, "are peculiar, and by no means well-known in the English market, though coming into notice under the name of Kelim carpets (Kelim being the Turkish for carpet). They are of remarkably bright colors, and of quaint, antique patterns; instead of being woven on cord, as are ours, they are exactly alike on both sides. The colors, too, are lasting. I saw one which had been in wear (in the best room, and therefore but seldom trodden upon) for thirty years, and it really looked but little the worse. They are marvellously cheap at Pirot, but are sold at Belgrade at a greatly increased price. They are much used all over Turkey in Europe, at least in the Sclavonian provinces, in Servia, Bosnia, etc., though, as far as I could learn, but little exported into Western Europe."

Technical Instruction in the United States.

Whilst Englishmen have lately been busy with the subject of Technical Education, our American cousins have been by no means idle. According to *The Carpet Trade*, a college of industrial art was last month established in New York, to be known in future as "The Women's Institute of Technical Design." The principal of the institute is Mrs. Florence E. Corey, an energetic and enterprising lady, and a skilful carpet designer. Some six years ago it suddenly flashed across the mind of this lady that as women almost invariably select carpets, it would be eminently proper for women, who naturally have a better knowledge of each others tastes than men, to design carpets. Taking a piece of Brussels carpet, she unravelled it and studied its principles of design and structure After much effort without instruction, she gained her first practical lesson in designing and manufacturing at Messrs Barber's carpet mills at Auburn, N. Y. Mrs. Corey afterwards gained theoretical instruction in the Art School of the Cooper Union, New York, and perfected herself in the practical details of the work in the carpet mills of Messrs. E. S Higgins and Co , she also received great encouragement from Mr Kendall, of the Bigelow Carpet Co., and from many others, until she became qualified to act as an instructress in the Art School where some of her earliest efforts were made.

Mrs. Corey at first encountered many refusals on the part of manufacturers to buy her designs, because of the common prejudice against the work of the gentler sex; now, however, her designs find a ready sale, and she is recognised as a skilful carpet designer.

The prospectus of "The Women's Institute of Technical Design" points out that it is established "to enable women to support themselves in a pleasanter and more profitable avenue than any yet open to them." Instruction in the art of carpet designing will be made a special feature, the lessons being practically illustrated by means of a Jacquard loom, a tapestry printing drum, and other machinery. The designing of linoleum, paper hangings, lace, oil-cloth, chintz, etc., will be taught. A carpet designing room is to be set apart for the execution of orders by the pupils. Prizes are offered for competition, and the successful designs are to be hung upon the walls of the institute for one year, at the expiration of which time they are to be returned to the student by whom they were executed. Several gentlemen, well known in the New York carpet world, are already selected to act with others as a board of judges, which will determine the merit of competitive designs. Lectures are to be delivered by several ladies and gentlemen, including Mr. McCallum, of the Bigelow Co., Mr. Wright, of the Hartford Co., Mrs. Anna D. French, and Mrs. Corey. The fees for students in the elementary classes is fifteen dollars per term, and for students in the advanced classes twenty-five dollars per term. There are two terms per year of four months each, the

remaining four months being set apart for the summer vacation. Scholarships will be founded; the founder upon payment of fifty dollars will be privileged to appoint a student; the scholarship to be known by the name of the person by whom the scholarship is founded The promoters hope that the contributions may be liberal, and that ultimately a good endowment fund may be provided for the Institute.

The Tariff on Carpets in the United States.

It is evident that the American people are growing restive under the burdens laid upon them by monopolists in one form or another. Already the question enters into politics in New York, and local anti-monopoly organizations have been perfected in every ward in the city, and in many of the towns of the state. At present the movement is directed mainly against the railroad and other corporations, which, having stolen almost the entire public domain of the United States, are now engaged in fortifying themselves for the battle which they are aware that sooner or later the people will wage against them with a bitterness which knows no relenting. Against that other form of monopoly, which consists in outrageously increasing the cost of the necessaries of life for the many, to enrich a favoured few, the fight can be brought on sooner, since it can be fought in the legislature instead of in the courts. It is a slow process to change a packed court; an angry and aroused people can soon unpack a Congress. And the day when the common sense of the nation will demand a sweeping reform in our revenue system is nearer at hand than many of those interested imagine. It is difficult to see what else the politician will have for a battle cry, and the most careless reader of history will find it difficult to remember a time when they failed to find some issue on which to arouse a popular excitement, by which they might ride to power. In the rude but expressive language of the street Arab, "its a cold day when they get left." Right here it may be well to put a cork in the mouth of these patriotic individuals who at the slightest mention of the tariff throw up their hands in well-feigned horror at the idea of destroying American industry. We must protect our home manufactures is the universal cry. If there is any one thing which ought to be settled in the mind of any intelligent observer of affairs, it is that the people of this country are not desirous of Free Trade. They do not even care to discuss the matter, and no political party would stand a shadow of a chance to win under such a rallying cry. But the necessity for some reform in the revenue system of the country is so universally felt, that it required every dollar that could be raised, and the most desperate endeavours on the part of those interested last fall to prevent the return to power of a party pledged to, at least, give the opponents of the present system a chance to be heard in the halls of legislation. We have nothing to do with politics, nor do we care to enter upon any discussion as to general questions of taxation, but when the interests we represent are involved, it is our duty to state the facts. Premising then, that we are heartily and thoroughly in favour of liberal protection to American manufacturing interests, and opposed to any sudden or marked changes in our economical system, we assert that the whole people are in the matter of carpets, being grievously imposed upon for the benefit of a few men, and they, in most instances, men who have amassed large fortunes at the expense of every consumer of carpets. A carpet in this country is not a luxury. By constant use, by education, by the operation of climatic laws, it has been one of the necessaries of life. It is found equally in town and country, in the mansion of the rich and the cabin of the poor, in the tenement of the labourer, in the hut of the lumberman. Its use is well nigh universal. What then shall be said of a system which levies a duty of one hundred and ten per cent. on one of the necessaries of life? And yet that is no more nor less than the tax imposed by the present tariff upon certain grades of carpets. Not one in twenty of the hundreds of carpet dealers who read this have ever taken the trouble to figure the matter, and while they know that the duty has been sufficient to drive foreign goods out of the market, very few have the slightest idea of the extent of the load which carpets have been compelled to carry. Take the low grades of tapestry Brussels, the production of which is increasing in this country at a rate out of all proportion to other goods of the kind. They are listed in England at 1s. 3d., say 28 cents. A schoolboy can easily figure that at 28 cents a square yard, and 35 per cent. *ad valorem* the duty is about *one hundred and ten per cent.* And when to this is added the additional protection afforded by the cost of 3,000 miles of ocean carriage, and the insurance on a perishable fabric, it will, we imagine, be readily conceded that this is protection with a vengeance Most nations put the burden of taxation on the President or Ambassador, whose smoke curls from the lips, or the Schloss Johannisberg which tickles the palate of the rich man. It is left for us to place the heavier weight on the humble fabric which gives colour and comfort to the poor man's home. It is sad, of course, to think of the ruin which would be wrought if the duty on cheap tapestries was reduced to that which is charged upon cigars, wines, and diamonds, but the average New Yorker, who sees E. S. Higgins stagger down Broadway under his load of $20,000,000, will doubtless feel that he can do for a while without such necessaries of his existence as cigars, wines and diamonds, rather even, than that the too luxurious mill girl shall be taxed one hundred and ten per cent. on the carpet which covers the floor of her Tenth Avenue palace. Taking the purchasing power of money in the two countries into consideration, it is doubtful whether the English weaver is not better off than his American competitor. Leaving then the interest of the operative out of the question, the whole thing resolves itself into a matter of fifty million of people taxing themselves for the benefit of five men. There is more to be said on this subject, but this will do for the beginning, and the committee having in charge a revision of the tariff, do not meet till December.—*The American Furniture Gazette.*

SCIENTIFIC AND ART NOTES.

Holland is now smitten with the mania for international exhibitions 1883 is the year fixed for the Dutch display which is to be.

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The opening of the exhibition at Pau has been fixed for the 17th January next. The gallery will remain open to the 15th of March following.

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The Liverpool Art Club has opened a loan collection of oil paintings by artists born before 1801. The pictures gathered in the rooms of the society are 340 in number.

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The proportion of sulphur in hair or wool is very large, and as they are daily growing they necessarily draw upon and rob the land of sulphur, its especial constituent. Prof Johnston states that the wool which is grown in Great Britain and Ireland carries off the land every year upwards of four million pounds of sulphur, to supply which would require the addition to the soil of 300,000 tons of gypsum. The hair on the heads of the British population carries off nearly half as much as the wool of the sheep.

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"*Knowledge*," an Illustrated Magazine of Science, is the title of a new weekly, edited by Mr. R. A. Proctor, and published by Messrs. Wyman and Sons, Great Queen Street, W. C. The magazine is intended to bring discoveries and inventions of science before the public in simple but correct terms, and will contain original articles, serial papers, scientific news, a correspondence section, and one for mathematics. There will also be columns for chess and whist. The editor intends to place science before the public in untechnical language, that it may thus be rendered interesting to the ordinary reader. As the price (2d.) is lower than that generally assigned to periodicals of this class we have no doubt it will find a large and ready sale.

* * * *

There is some probability that at no distant date the Sheffield firms engaged in the heavy trades will substitute the electric light for gas in their works, as it is found upon trial that the softer light is a great advantage to the workmen. Already three large local firms have adopted this system of lighting. At the works of Messrs. Davy Brothers, Engineers, Park Ironworks, the Brush system, fixed by Messrs. Hammond and Company, has been introduced, and the seven lights have been found to be of great utility, chiefly in the erecting-shop. Messrs. Cammell and Co., of the Cyclops Works, have arranged for sixteen lights, supplied from a Brush dynamo machine, driven by one of Kitson's engines, and the trial recently made was very successful. The test was made with seven lights (double Brush lamps), six of which are in the huge shed where the armour plates undergo the process of planing. The lights were both steady and brilliant, and the experiment was considered highly satisfactory. Messrs. Steel, Tozer, and Hampton, another large firm engaged in the heavy trades, have also decided to adopt electric lighting; and several other firms also contemplate its adoption.

ORIGINAL DESIGNS.

The first of the designs issued this month is of a panelled and floral description, and is adapted alike for cretonne and tapestry. This pattern would have an equally good effect if coloured with either one or two grounds.

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Our double-page plate is intended as a suggestion to manufacturers of carpets. The pattern is not drawn to any particular scale. The colouring we give as follows:—The ground Olive Green—a shade or two removed from Black.—the Ornament Brown, Cream, Crimson, and Blue; the latter two should be of dull shades A second colouring might be a Black ground, Crimson, Green, and Blue also of dull shades, and a warm Drab. A common colouring for this style of carpet is Black, Green, Blue, Red, and Yellow.

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*** We beg to inform manufacturers and others that adaptations of designs, published in the "Journal of Fabrics," can be made at the Office by experienced Designers, and that Original Designs can also be furnished at moderate charges.

MONTHLY TRADE REPORTS.

Wool.—In London and Liverpool the degree of firmness given to the market at the last sales continues. English and foreign wools share alike in the firmness, although sales are not very considerable. At Edinburgh and Glasgow the improvement we chronicled last month continues In some cases higher prices are obtained and a most hopeful feeling pervades the market. At Leeds there has been a good consumptive demand; higher prices are looked for at the next London sales commencing on the 22nd inst. In Bradford the business fell off toward the middle of the month, but a cheerful tone now characterises the market; the enquiry both for English and Colonial wools is very fair. At Halifax buying has been on a restricted scale, although spinners are running more machinery; but in the preceding month they had in a great measure covered their wants, so that since they have bought sparingly Staplers hold out for full rates. In the yarn trade at Bradford and Halifax, the home trade continues to improve, and on the part of export buyers there seems a greater disposition to buy, in many cases merchants have acceded to higher prices asked by spinners.

Cotton.—The tone of the market at Liverpool and Manchester has improved during the month owing to prices having settled to a fair value. During the last week of the month large quantities changed hands, prices having a slight tendency to rise. In the yarn trade only indifferent business has been done. Manufacturers have bought fairly during the month, but the abundant supply in the market has prevented spinners reaping any great benefit. The demand for India and China has improved at fairly remunerative prices.

Woollen.—The activity noticed last month still continues to a considerable extent; throughout the districts manufacturers are well employed, some having orders on hand that will keep their machinery running for some months to come.

Silk.—The markets have again slightly improved, manufacturers having received more remunerative prices for fabrics. In the home trade business has been in the better class of fabrics. Prices for the raw material keep tolerably firm.

Linen.—The markets generally exhibit a buoyant tone; considerable business has been done at advanced rates, and prices have still an upward tendency. The business in yarns both for home and export has been characterised by continued activity.

Carpets.—Manufacturers of tapestry are fairly busy. There is a moderate business doing in rugs, with an improving demand. Manufacturers have held a number of meetings during the month in reference to the Brussels department of their manufacture, and a new list by which they have agreed to abide has been issued, fixing best Brussels on the basis of 3s. 9d. per yard. This decision has naturally curtailed business. Many orders have been refused at the old prices. A hopeful feeling pervades the market.

Lace.—The trade has remained in a healthy condition, all departments being well employed. The demand being in excess of the supply, prices have an upward tendency. Some good orders for curtain materials are in course of execution.

Invention for Dotting Light Fabrics.

Dotted or chenilled tulles are fabrics extensively used in the toilet of ladies, the ornamentation of which has hitherto been done by the application to the tissue, by hand, either of chenille, or of small circles previously cut out of velvet. This work, which naturally takes considerable time, greatly increases the cost price of the article.

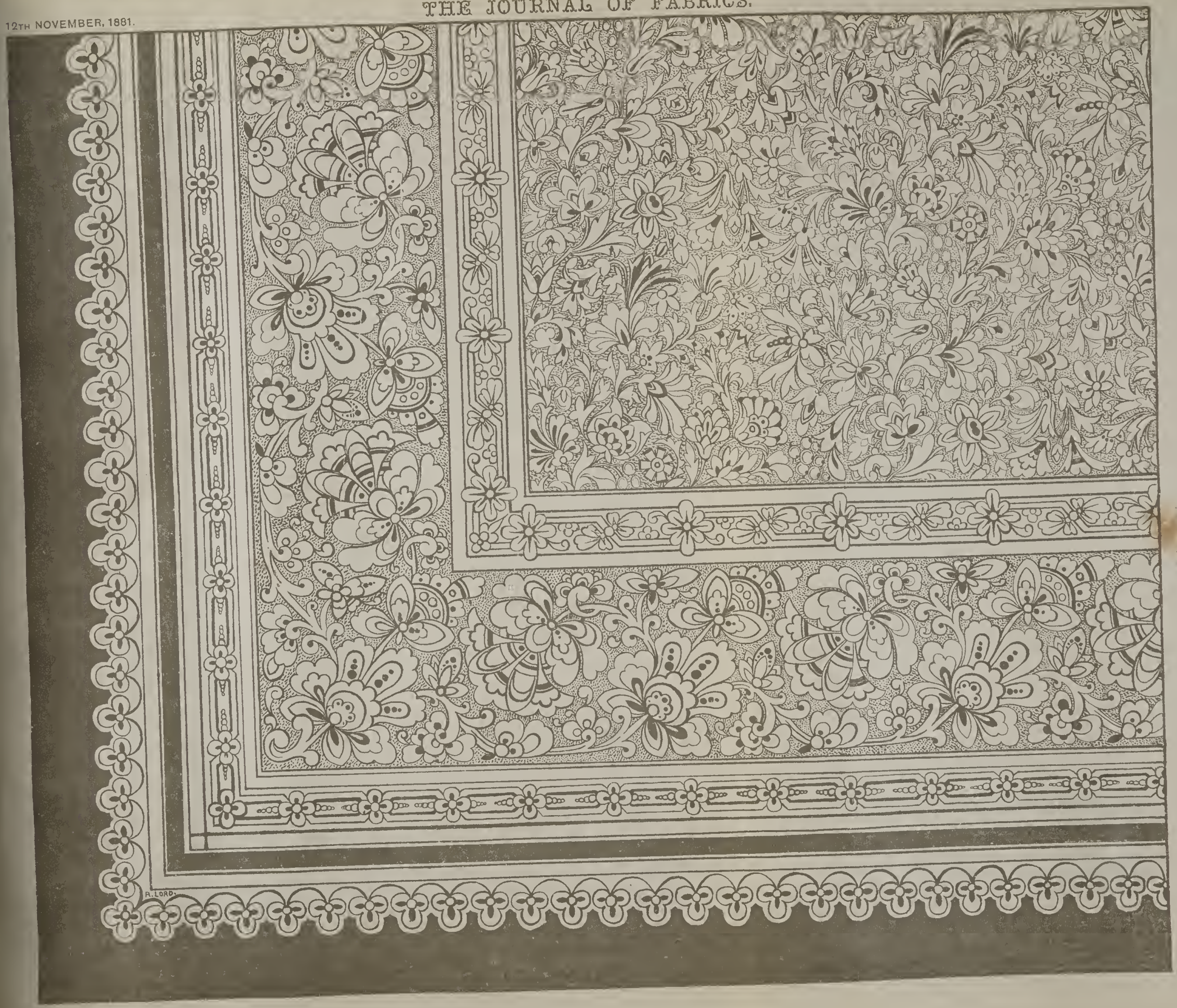
A few trials at doing the work mechanically have been made, but without any practical outcome. The workwomen who do the dotting, are paid at Lyons at the rate of 80 centimes per 100 dots; so that if we take tulle with dots counter-simple 0·04 of an inch, which is the smallest quincunx used, and suppose that the tissue is 31 inches wide, and that the daily maximum production is one yard, we find that 400 dots at 80 centimes per 100=3 francs and 20 centimes, the cost of dotting per yard. It is true that the workwoman furnishes the velvet herself.

Mr. C. Ricanet, of Lyons, has recently invented a machine with which he affects mechanically the different operations of dotting, not only on tulle, but also upon gauzes or any other light tissues whatever, such as those of cotton, silk, wool, &c. Aided by a talented mechanic, he has succeeded in constructing one of those masterpieces of wonderfully accurate mechanism, of which the textile industry appears to have the monopoly—at least it is permissable to judge so, from the remarkable inventions of Vaucauson, Jacquard, and others. The object of this new machine, which has been doing its work for a few days only, is to reproduce artificially chenille embroidery on light tissues by mechanically cutting out and gluing small circles of velvet upon these fabrics.

For this purpose all kinds of velvet may be employed, and in order to facilitate the cutting they are previously coated on the reverse side with any glue or gum whatever, which gives the velvet the stiffness favourable to the action of the punch. To effect the object desired, the apparatus has three successive operations to perform; first, cutting the circles; second, moistening; and third, fastening down the dots upon the tissue according to a definite order and spacing. The machine may be constructed upon any scale whatever, although at present it is only made for operating on pieces 31 inches wide; that being the normal width of tulles. The quincuncial arrangement of the dots is effected by the punching, moistening and fastening down of odd and even dots, combined with the forward movement of the tissue to be chenilled.

We have stated above that the maximum daily hand production of tulle in quincunxes of 0·04 of an inch is about one yard. At the rate of 30 revolutions per minute, and for the same article as that just mentioned, this dotting machine is capable of producing theoretically 360 yards per 10 hours, but practically this production is reduced to about 250 yards, which, however, is sufficiently satisfactory.

The report of the Commissioners of Patents for Inventions has recently been issued for the year 1880, and shows that, notwithstanding the repressive taxation by which it might almost be supposed that it was sought to discourage invention, inventors come every year in greater numbers for protection for their ideas. In 1852 the number of applicants for patents was 1,211. From that year forward there has been a steady increase until last year, when the total number was 5,517, or an increase of nearly 200 over the total for the preceding year. Of the applications made from 1852 to 1880, about 65 per cent. became valid patents. Of the valid patents obtained upon applications made from 1852 to 1873, some 30 per cent. paid the third year's stamp-duty and continued in force for 7 years; and nearly 11 per cent. paid the seventh year's stamp-duty of £100, and were in force for the full term of 14 years.


R. LORD.

Proposed Grand International Exhibition in Manchester.

Mr. Ellis Lever has published a pamphlet containing a series of suggestions for a grand international exhibition of the industrial arts, manufactures, fine arts, scientific inventions, discoveries, and natural products of all countries, to be held in Manchester in 1882 The pamphlet also contains an historical review of the origin, rise, progress, and development of the chief exhibitions which have been held from 1797. It is dedicated to the Mayor of Manchester (Mr. Alderman Baker), who, Mr. Lever states, has expressed his entire approval of the projected exhibition. Mr. Lever thinks the exhibition would not only be an immense success both financially and nationally, but that it would also be a great boon to Manchester and the district. He points out that the productions and manufactures of the county palatine and adjoining counties are more numerous and diversified than those of all other portions of England put together. Since the exhibitions of 1851 and 1862 were held, great strides have been made in art, science, and industry. It is nearly a quarter of a century since the Art Treasures Exhibition was held in Manchester, and Mr. Lever contends that the present state of the industries of the district, and the nature of many of its products and handicrafts, may be adduced as special and very strong reasons why the proposed exhibition should be held in this great industrial centre, where the millions of its artisans may have ample opportunities of visiting the exhibition again and again, and of learning the lessons which such a collection must inevitably teach. A further, and to his mind an important, reason why the proposed exhibition should be held in Manchester is that the city has not as yet a museum or institution of the South Kensington kind equal to her wants and requirements; not as a rival to that national institution, but one worthy of the manufacturing metropolis of the kingdom, and suited to the needs, both technical and artistic, of her working population. Such a permanent institution might be purchased out of the surplus profits of the exhibition; and the nucleus of a collection could also be formed by a portion of its exhibits. The chief materials to be used in the construction of the building—glass and iron—are now exceedingly cheap, as indeed are also all other building materials, and they are native to the county and district. The building should be designed with a view to permanency; and the materials used therein should, for that reason, be durable. The site, also, should be selected with that object, and be secured out of the profits of the exhibition. Mr. Lever is emboldened, therefore, to make this proposal in the hope that at present, as in 1857, a number of gentlemen of position and public spirit will be prepared to assist in carrying it out, and of ensuring for it that success which in his opinion it deserves. Thirty distinct departments, or groups of articles, are set forth as deserving special attention in the projected exhibition.

The Protection of Inventions.

As there are many who intend to avail themselves of the protection afforded by the Protection of Inventions Act, 1870, at the forthcoming Smoke Abatement Exhibition at South Kensington, and as much misapprehension exists as to the nature and scope of the protection afforded by it, it may be as well to point out what is the real status of an exhibitor of an unpatented article under the Act. The Act was passed to enable an invention to be exhibited without prejudice to a patent subsequently obtained for such invention—that is to say, that the publication which would otherwise invalidate the patent should not do so in the case of any one holding a certificate under the above Act. But it goes no further. For, suppose A exhibits an invention, intending to patent the same when the exhibition is over, and B in the interim obtains letters for the same idea, there is nothing in the Act that would enable A to deprive B of his rights as patentee unless he could show that B had derived his information from A's exhibit, an alternative very rarely possible. Since the decision of Lord Hatherley in the case of "*Ex parte* Bates and Redgate," the first to obtain the grant of letters patent has always been held to be the inventor, in the absence of fraud. It will therefore be seen that the Act affords no protection at all against unscrupulous persons pirating and patenting any idea they may approve—a fact with which it is highly important inventors should be made acquainted. Although attention has only been drawn to the danger from dishonest appropriation of any invention, it must be borne in mind that the same remarks apply in the case of any one who may patent an idea similar to the one being exhibited, in good faith —a coincidence by no means rare.—*Iron.*

A Substitute for Silk.

In a French textile journal, M Bordier has lately pointed out the great advantages derivable from a plant known in France by the name of *fafetone*. It is indigenous in South America, and abounds, in the wild state, in France and in other parts of Europe. In Italy there are several varieties of it. It is an Asclepias with opposite leaves and simple stem, and the flower, composed of two oblong petals including the seed, is crowned with an aigrette of white silky hair. Several attempts have been made in Italy to utilise the hair of the plant, but with little success, owing to its being too short and brittle to be spun and woven alone, and when mixed with other fibres having a tendency to weaken the material. After many experiments M. Bordier has discovered that it is not the hair that should be treated, but the stem—from which he has succeeded in obtaining an excellent fine white resistant fibre, which is capable of replacing silk, &c. He states that it is superior to jute, of which the French import annually from England—a quantity valued at sixteen or seventeen million francs. The stem of the *fafetone* has the advantage of being incorruptible in water. These important statements by M. Bordier will doubtless be fully tested.

Colonel Shaw, United States Consul at Liverpool, lately visited Oldham on the subject of complaints that have been made respecting the adulteration of American cotton. He was accompanied by Mr. Andrew, secretary of the Cotton Spinners' Association. The adulteration of American cotton is regarded as a great grievance in Oldham, and it is hoped that the information Colonel Shaw will have gained will result in great benefit to the spinners. Amongst the stuff found in the cotton bales are oyster shells, a large quantity of these having been discovered amongst cotton recently bought by an Oldham company, which has made no profit in consequence.

MACHINERY, TOOLS, ETC.

Messrs. Oldham and Richards' Machine Tools.

We have received from Messrs. Oldham and Richards, of the Red Bank Iron Works, Manchester, an illustrated catalogue of various kinds of Engineers' and Machinists' Labour Saving Tools, including lathes, planing, shaping, slotting, drilling, boring, and coach-spring making machines; also vertical high pressure steam engines. These tools and machines are manufactured by the above firm, and the exactness of proportion, excellence in finish and lowness in price, must command a ready sale.

Our space being limited we can only notice a few of the Tools. The first illustration in the catalogue is of a self-acting, slide and screw-cutting lathe, of superior workmanship, with all the latest improvements. It is on an accurately planed bed, having double geared headstocks, steel spindles, parallel necks and gun-metal steps, loose headstocks, arranged to slide taper, having a bridge gap, removable to admit large diameters, and guide screw with double clasp eccentric nuts. There is a compound slide rest, the bottom slide fitted in the whole length of the carriage, which can be removed to bolt objects on (for boring), the top slide will swivel to any angle. There is also a strong adjustable back-stay, and there are 22 change wheels with reversible motion for cutting right and left threads. In addition to this there are one boring and one driving face plate, top driving apparatus and screw keys.

Then follow illustrations of Improved Self-acting Planing Machines, with all the usual appliances. They have a new simple self-acting strap and feed motion, which is worked by friction, thereby rendering it almost impossible to break any of the feed wheels (the large machines have the strap forks fitted with rollers, to avoid friction on the strap), and a self-rotary oiling arrangement, whereby the galling of the vee is rendered almost impossible, with screw keys complete.

Then there are illustrations of Double Geared, Vertical, and Single Speed Drilling Machines; the former being very strong and useful machines, generally adapted to heavy work. These are followed by Shaping, Slotting, and other Machines, which, for reasons above named we are unable to notice. We especially commend the catalogue to the notice of manufacturers, engineers, and other users of such machines.

Clerk's Patent Gas Engine.

We have had our attention directed to Clerk's Patent Gas Engine exhibited at the Electrical Exhibition in Paris, by Messrs. Thomson, Sterne and Co., of the Crown Iron Works, Glasgow, which has attracted much attention, and is likely to prove a great success, as it possesses the distinctive feature of making an explosion at *every* revolution.

Hitherto all Gas Engines using compression before ignition have been arranged to make at most one impulse for every two revolutions. It is perfectly evident to all that if an impulse could be obtained for every revolution a great increase of power would result. The Engine with but a trifling addition in weight could be doubled in power.

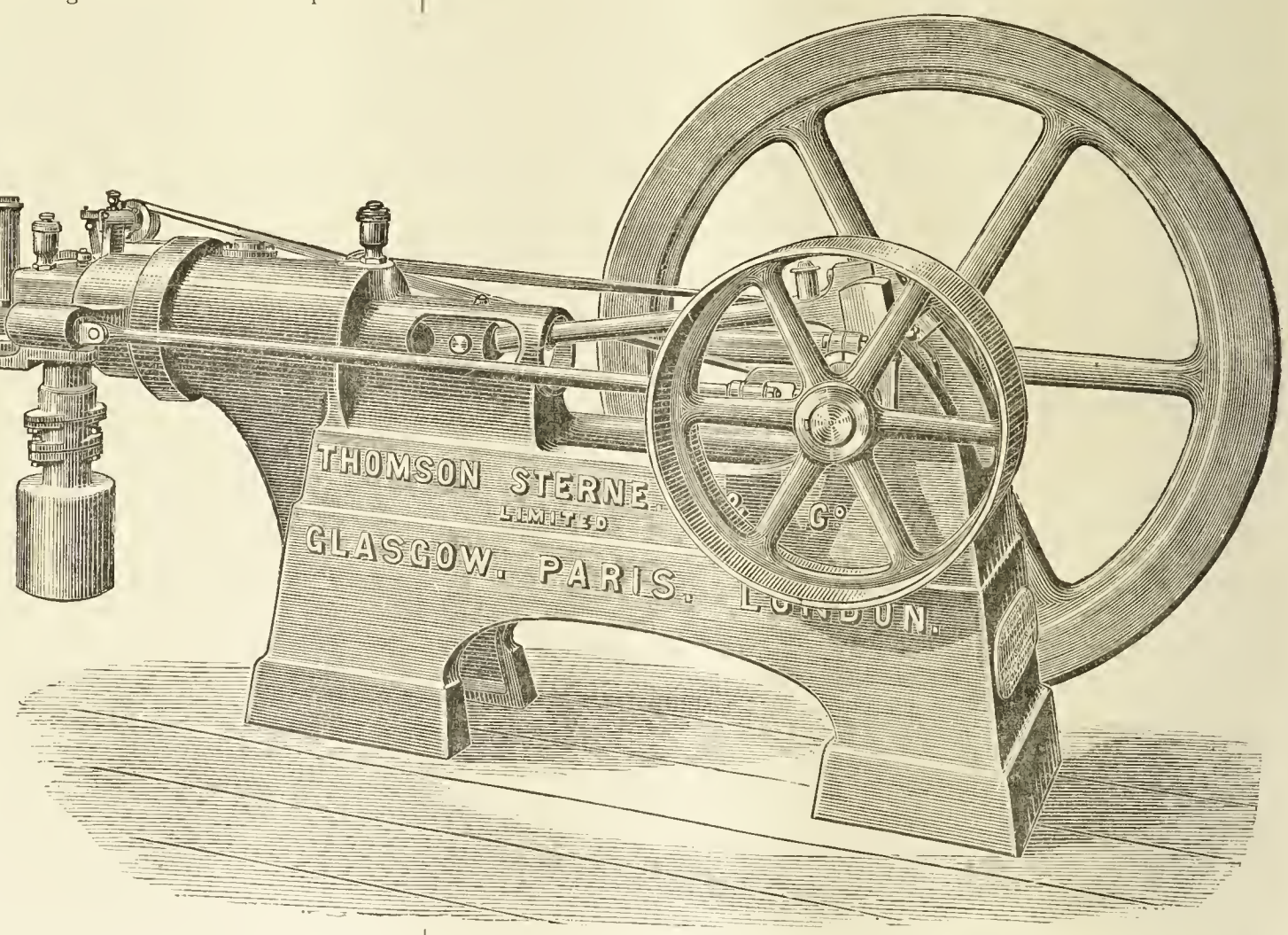
Many attempts have been made, and many patents obtained, for methods professing to accomplish this very desirable end, but up till now all have failed. At first sight it seems a very simple thing to do, and it astonishes one very much to find no result. Simple as it appears on paper, a few experiments will speedily convince any engineer that many and apparently insuperable difficulties lie in the way.

The Engine exhibited has a motor cylinder of 6 inches diameter, and a light displacer cylinder of larger diameter. The stroke of the piston is 12 inches, and it is connected to a crank by the usual rod; but the pressure in the displacer cylinder never exceeding 5 lbs. per square inch the connections are very light, and it is driven from a pin on one of the fly wheel arms.

The displacer crank pin is in advance of the motor crank, and at right angles to it. When it moves forward the combustible mixture of gas and air is drawn into the displacer cylinder during the first half of the piston's stroke, at which point the gas is cut off, and only air admitted for the remaining part of the stroke. The displacer on its return stroke discharges its contents through a lift valve into the motor cylinder, the piston of which is hot at the out end of its stroke, and has uncovered an annular port in the cylinder communicating with the exhaust pipe. When this port is uncovered the hot products of combustion discharge through it until the pressure in the cylinder has fallen to atmosphere, when the air from the displacer entering at the back end expels the remaining hot exhaust, and passes in part through the exhaust pipe. The clyinder is now filled with pure air, and when the combustible mixture enters displacing in turn the air, the cylinder contains nothing but an ignitable mixture and air.

The motor cylinder in its in-stroke compresses the mixture into a space at the end of the cylinder, the pressure rising to 45 lbs. above atmosphere when ignition takes place, and the pressure now becomes from 200 to 250 lbs. per square inch above atmosphere.

The piston moving forward the pressure gradually falls, and when the end of the stroke is reached, the exhaust discharges at about 30 lbs. above atmosphere. This cycle of operation is repeated at every stroke.



In larger Engines the terminal pressure before exhausting is very much less than 30 lbs., sometimes as low as 5 lbs above atmosphere, but this is obtained by an arrangement which allows of a greater expansion.

The volume swept through by the displacer piston is greater than the combined volume of motor cylinder, and the space at the end of it into which the ignitable mixture is compressed, as half of its charge is pure air it follows that at every stroke of the Engine the whole products of combustion are discharged and replaced by pure cool air, before any combustible mixture is allowed to enter.

This arrangement produces the greatest possible certainty in the action of the Engine, the great obstruction to progress in constructing large or powerful Gas Engines has hitherto been premature ignitions; the combustible mixture entering the cylinder still containing products of the previous combustion, ignites at the wrong time either by flame still burning in the cylinder or by sparks on the walls of the combustion chamber due to the ignited carbon from the decomposition of the oil used in lubricating. To secure freedom from these irregular ignitions it is necessary first to clear out thoroughly any hot burned Gases, and second secure a low enough mean temperature of the surface of the cylinder and combustion chamber, to render the existence of sparks impossible.

This object is secured in a simple and effective manner by the use of the displacer cylinder, as the charge is not compressed in the cylinder but merely passed into the motor cylinder at such a pressure above atmosphere as is necessary to lift the valve and to discharge the exhaust, it follows that it may be made of any size found necessary to pass the volume of air for clearing and cooling.

This device is the essential feature of the Engine, making an ignition at every stroke possible. In previous Gas Engines it was sought by only igniting once every second revolution, and even once every third revolution, to prevent premature ignition, but although partially succeeding, yet surely the success is dearly purchased at the cost of so great a loss of possible power.

It is found by the prolonged experience of those using Engines igniting every second revolution that when working at full power they back ignite very often, and it is only when running light that they are free from this source of trouble. The larger the Engine the greater tendency to back ignition, and the less possibility of using the Engine at its full number of ignitions.

Now, Clerk's Gas Engine may be continuously worked up to its full power igniting at every stroke without irregularity or stoppage.

The arrangements for admitting gas and air, for cutting off the gas at the proper time, for igniting and for exhausting are of the simplest nature.

An automatic lift valve serves to admit the mixed charge of gas and air to the displacer cylinder, another similar valve passes the charge from the displacer to the motor cylinder. A small slide in the back of the Engine, worked by an eccentric on the main shaft both ignites the charge at the proper time and cuts off the supply of gas to the displacer at half its stroke.

There is no exhaust valve; the piston uncovers the annular port at the out end of its stroke, and the exhaust is discharged, and a fresh combustible mixture is passed into the cylinder by the displacer before it returns.

The igniting arrangement is quite different from that ordinarily used in Gas Engines; this is necessitated by the much greater number of ignitions to be accomplished per minute; the ignition ordinarily used could not be made to act much oftener than 80 times per minute. The arrangement used by Clerk can ignite if necessary as often as 300 times per minute.

The ignition slide has in it a small cavity, from each end of which is a port opening at opposite faces; at one end of this cavity there is a perforated plate through which ignitable mixture passes from the motor cylinder, the communication being made by a small hole in the slide, and a gutter in the face of the slide which is constantly on a hole in the Engine face leading to the combustion chamber.

The mixture, after passing through the perforated plate or grating, is lighted by a bunsen flame and burning at the grating, it fills the cavity completely with flame and discharges at the port in the face. The movement of the slide causes this port to open on a small port in the Engine face direct into the combustion chamber, causing the immediate ignition of the charge.

The movement of the slide of course cuts off all communication with the atmosphere before communicating with the cylinder.

The ignition port is extremely small, only $\frac{1}{2}$ inch $\times$ $\frac{1}{4}$ inch, so that the pressure necessary to keep the slide to its face is but slight, even at the high initial pressure of 250 lbs. per square inch.

By this method the whole slide is of small dimensions and there is no necessity for ventilating the port, as the mixture from the cylinder requires no exterior aid to support its combustion. The frequency of ignitions therefore is thoroughly within control.

The two automatic lift valves, which if used in the ordinary way, would cause considerable rattle, are rendered perfectly silent by a very simple arrangement of air cushion.

The Engine exhibited gives 6 H. P. by the Brake at 145 revolutions and indicates about 10 H. P., as the cylinder is only 6 inches diameter and the stroke 12 inches, it will be seen that this is a much more powerful Engine than any other at present in use.

ODDS AND ENDS.

There are thirty-five male prisoners employed in the carpet department of the Baltimore City jail.

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The council of the Bradford Technical School have decided to invite the Prince and Princess of Wales to the town on the occasion of the opening of the Technical School, in Horton Road. The new building is fast approaching completion, and it will probably be opened early next year.

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"The carpet mills of Philadelphia," says the *Ledger* of that city, turned out enough carpeting last year to cover about eleven square miles of flooring, or, in round numbers, to carpet tne Main Exhibition building three hundred times. This is an enormous product. but there is every prospect that it will be largely increased in the near future.

* * * *

Distinctive telegraph stamps are now discontinued, and postage stamps of all amounts are available for the payment of telegraph charges. Telegrams may be posted in letter-boxes during the night, or where there is no telegraph office within convenient distance, and ordinary paper may be used where telegraph forms are not available. If enclosed in an envelope, the envelope should be marked "Telegram—immediate."

* * * *

Switzerland, notwithstanding its landlocked position and the wall of hostile tariffs by which it is surrounded, is steadily improving. Its exports to France in 1880 exceeded those of 1879 by 14·9 per cent. (in quantity); to Germany the increase was 7·8, to Austria 20·90, and to Italy 19·20 per cent. Its imports from those countries rose in the same time 10·60, 2·7, 24·70, and 33·30 per cent. respectively.

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The total imports from France into this country in the ten years 1871-80, rose from £29,850,000 to £41,970,000—being £12,120,000, or almost 40 per cent. The imports of food rose from £11,420,000 to £14,510,000; those of clothing from £12,700,000 to £20,940.000; and those of all other articles from £5,730,000 to £6,520,000. The greatest development by far, it will be seen, has been in clothing, the augmentation in such imports being nearly 70 or 75 per cent. greater than the aggregate augmentation.

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A writer in the *American Furniture Gazette* says: "Let me hazard the prediction that the tapestry velvet is the popular carpet of the immediate future. The demand is increasing day by day, and the enterprising manufacturer who first gets to work on a considerable scale will find his production taken up as fast as it comes from the loom. The fabric is reasonably durable, is very attractive in appearance, and is cheap in comparison with the Wilton, the place of which it will take among the same class that now buy tapestry in place of body Brussels.

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The Sidney Chamber of Commerce recommend shippers to stipulate that their wool should be stowed in single dumps, strapped with bands not less than eight feet long and three inches lap, as in that way it is likely to be delivered in England in a condition that will assure its most satisfactory sale. The Lloyd's authorities in London not having given their assent to the form of average bond recommended by the Chamber, the Committee have appointed a Sub-Committee to further consider the subject with the Underwriters' Association.

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The latest addition to the Peninsular and Oriental Company's fleet is the screw-steamer Carthage, which has arrived in the Thames after a satisfactory run from the Clyde. The vessel is 5,100 tons gross register, and has engines of 5,000 horse power indicated. She is 430 feet long, 44 feet beam, and 36 feet deep, her cargo capacity being 4,000 tons. Like her sister ship, the Rome, the Carthage is fitted with all recent improvements, the saloon being elaborately decorated with carved walnut the work of Signor Cambi, of Sienna. The Carthage was built and engined by Messrs. Caird and Co, of Greenock, who also have in hand two other steamers for the company of nearly similar tonnage and power.

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Several French gentlemen (who had a card of introduction from Mr. Owen Roberts, M.A., Secretary of the Clothworkers' Company) on the 20th ult. paid a visit to Bradford for the purpose of seeing the new Technical School, in Horton Road. They were conducted over the building, and afterwards they spent some time in making an inspection of the rooms in the Mechanics' Institute, in which at present the work of the Technical School is carried on. During the afternoon, accompanied by several members of the Council of the Technical School, they paid a visit to the new building, and also spent some time in making an inspection of the classes at work.

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Just now there is an extraordinary activity in trade at San Francisco. The *Journal* of that city says:—The fact of the exchanges of the Clearing House exceeding $17,000,000 during the past week speaks wonders for the state of our fall trade. The figures are double those of the corresponding week last year and nearly 50 per cent. more than those of the preceding week. And yet it was not collection week. The exhibit is really wonderful, and astounds the most sanguine friends of commercial progress.

The Committee of the Cardiff Fine Art and Industrial Exhibition are handing over a sum of over £3,000 for fitting up the Free Library buildings and providing works of art, &c.

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Mr. Chamberlain, M.P., in addressing the students of the Wednesbury Art School recently, referred to the advantages to be gained from a careful study of art, and he strongly advised every one to take a great interest in the subject.

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Apropos of the recent visit of M. Léon Say and M. Raoul Duval to Calais, the *Echo du Nord* gives an account of the progress being made with the Channel Tunnel. It is no longer a question of preliminary experiments, says this authority, for the work is being energetically and successfully pushed forward, and a section will be ready for inspection towards the end of this month or the beginning of December. The boring has already been effected to the extent of 1,800 mètres from the French and 1,600 mètres from the English side. This makes altogether rather more than one-tenth of the entire distance to be pierced.

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In 1880, England's trade with the world amounted to £698,000,000 in value—the largest ever known. In 1879 it was £612,000,000. The German Empire, with 40 000,000 of people, had £371,000,000 of trade. The United States, with 50,000.000 of people, had £239,000,000 of external trade. These two countries together, with a population of 90,000,000 had a trade of £610,000,000, while England, with 35,000,000 of people had a trade of £612,000,000 France has £313,000,000 of trade,with 36,000,000 of population. Russia has £183,000,000 of trade, with 80,000,000 of people. Holland has £116,000,000 of trade, with 5,000,000 of people.

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The new weaving School at Crefeld now in course of erection is likely to be of special value to the silk industry, not only from the valuable character of the technical instruction in contemplation, but also from the collection of mediœval tissues which will probably be included in the opening programme af the academy. The *Kolnische Zeitung* in a recent number refers to an exhibition of tissues of the middle ages which took place at Crefeld in 1852, and considers that the opening of the technical institute in 1883 will afford the central point of the German silk trade a favourable opportunity of showing the world what our forefathers were capable of doing in textile manufacture, by what the writer designates as a retrospective exhibition of the weaving industry.

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The importance of covering the face of Pulleys with leather is realised by but few persons having charge of machinery. Fully fifty per cent. more work can be done without the belts slipping if the face of the pulleys is so covered. Leather belts used with the grain side to the pulley will not only do more work, but will last longer than if used with the flesh side to the pulley This is owing to the fact that the grain side is more compact and fixed than the flesh side, and more of its surface is brought in contact with the pulley. The smoother the two surfaces the less air will pass between the belts and the pulleys. The more uneven the surface of the belt and pulley the greater is the strain necessary to prevent the belt from slipping; for what is lost by want of contact must be made up by extra strain on the belt. Leather belts, with the grain side to the pulley, can drive thirty-four per cent. more than those with the flesh side.

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The following is a full list of all the British awards at the International Electrical Exhibition at Paris:—Grand Diplôme d'Honneur—Post-office. Diplôme d'Honneur—Society of Telegraph Engineers, Telegraph Construction Company, Eastern Telegraph Company, Submarine Telegraph Company, Professor Hughes, F.R.S., Sir W. Thompson, F R S., Siemens Brothers. Lettres de Co-opération—Royal Institution, King's College. Gold Medals—Anglo-American Brush Company, British Electric Light Company, Indiarubber, Gutta Percha, &c., Company, Clark and Muirhead, Edward Bright, Elliott Brothers, Swan. Silver Medals—Apps, Ayrton and Perry, Brotherhood, Consolidated Telephone Company, Fyfe, Johnson and Nephews, Robey, Sabine, Saxby and Farmer, Spagnoletti, Thomson and Sterne. Bronze Medals—Blakey and Emmott, Bourne, Coxeter, Foxcroft, Hedges, O'Lawler, Patterson, Ransome, Sabel, Sax, Smith, Stiff and Sons, the Cowson Gas Company, Wallis and Steevens, Whitecross Wire Company.

* * * *

A patent has been taken out in Germany for a new description of elastic and flexible lacquer, which will not peel off, and which is suitable for the coating of carriage cloths, plans, and other articles to be folded up. as well as for wood and iron work, walls, etc., but which may also be employed as an isolating layer for damp rooms, as a means against dry rot, and in rendering stuffs water-proof. To produce the lacquer, fifty kilogrammes of linseed-oil varnish are heated up to boiling point. In another vessel about fifteen kilogrammes of lime are slaked in twenty kilogrammes of water. As soon as the lime boils, about fifty kilogrammes of hot melted raw caoutchouc are added to the lime-water, and the whole is stirred until it has become thoroughly mixed. This composition is poured into the boiling varnish, the whole being stirred all the time. Further stirring takes place until a homogeneous mass is formed, which is afterwards strained or filtered, and left to cool. After cooling, the lacquer has a pap-like consistency. To apply the lacquer, it is diluted, with the desired quantity of varnish, and put on with brushes either in a warm or cool state. But it is said to be better to apply it warm, as then no varnish is required for diluting it. In rendering linen water-proof, the lacquer may be put on by means of brushes or rollers. After treatment, the linen or other stuffs, paper, etc., are hung up to dry. Stuffs are ready for use in two days. The product is stated to be lustrous, elastic, not sticky, and perfectly water-proof.

The Postmaster-General has signified his intention of sending to the forthcoming International Electric Exhibition at the Crystal Palace the whole of the telegraphic and other apparatus shown by the British Government at the Electric Exhibition in Paris.

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The promoters of the exhibition at Adelaide, in Australia, announce that they are engaged in organising similar undertakings at Perth, West Australia, in November, and in New Zealand next March. The preparations for the West Australian exhibition are progressing rapidly towards completion.

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The 8th annual report of the Brazil Industrial Cotton Factory at Macacos (says the *Anglo-Brazilian Times*) gives the profit of the year at $86,248, with which sum the accumulated profits have risen to $219,195, no dividend having been paid on account of the situation of the company. The fiscal committee, however, recommends that $200,000 shall be distributed in shares to the shareholders, and that the directory be empowered to distribute hereafter, when convenient, among the shareholders, shares equivalant in nominal value to the amortisations of debt effected, until the capital be thereby increased to its definite amount of $1,500,000. The cotton used up in the year was 406⅝ tons costing $247,441, or 276 reis, say 6d. per lb, and the cloth produced measured 3,059,440 metres, worth $662,437. The factory employs at present 387 hands, of whom 75 are women, 86 boys, and 44 girls. The goods made in this factory have a protection of fully 60 per cent.

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Without considering the processes by which cloth is waterproofed with such substances as Indiarubber, oil, wax, and varnishes, there are several processes in practical use by which cloth is rendered non-absorbent of water, and, for all practical purposes, waterproof, without materially affecting its colour or appearance, greatly increasing its weight, or rendering it entirely air-proof. These processes depend mainly upon the reaction between two or more bodies, in consequence of which a substance insoluble in water is deposited in the fibres of the cloth. The following is one called Lowry's process. Take of soap two ounces, glue four ounces, water one gallon. Soften the glue in cold water and dissolve it together with the soap in the water by aid of heat and agitation. The cloth is filled with this solution by boiling it in the liquid for several hours, the time required depending upon the kind of fibre and thickness of the cloth. When properly saturated, the excess of liquid is wrung out and the cloth exposed to the air until nearly dry, then digested for from five to twelve hours in the following solution—alum thirteen ounces, salt fifteen ounces, water one gallon. It is finally wrung out, rinsed in clean water, and dried at about 80 deg. Fahr.

The Prevention of Smoke.

The old subject of controversy, "Smoke in the Manufacturing Districts," is constantly being ventilated in the daily papers. In a letter to the *Times* of the 31st ult., Mr. Joshua Fielden, late of the firm of Fielden Bros., of Todmorden, who works one of the largest cotton spinning concerns in the United Kingdom, describes an apparatus in use at their works, which he states has been a great success, as a saver of fuel and consumer of smoke. In his letter Mr. Fielden states that from long observation he had noticed that whenever the furnace door was opened to throw on coal or stir the fire, as soon as the effect could be seen at the top of the chimney a dense volume of smoke issued therefrom. Hence he came to the conclusion that smoke was produced by the admission of cold air into the furnace, and that to prevent smoke, it was absolutely necessary that the furnace should be supplied with fuel without opening the fire-door. He further states that "Juke's Furnace," in which the fuel was supplied by means of a hopper outside the boiler, accomplished this, and that no smoke was made where it was used. But this furnace was inapplicable to double-flued boilers, and could only be used by being placed under the boiler, and as two-flued boilers, fired internally, were in such general use in the manufacturing districts, he was satisfied that a "smoke preventer" to be adopted generally by the trade, must be applicable to these boilers. After many attempts to overcome the difficulty, a furnace was invented applicable to two-flued boilers, with the fires in the flues, which reduced the consumption of fuel and did not produce smoke. We quote the following description of the furnace from his letter:—"In front of each flue of the boiler is built a brick arch, and in front of this is a hopper. Under these are travelling grates, which move backwards and forwards. Inside the boiler are hollow grate bars, made of wrought iron, which slope downwards, and through which the water passes from the bottom to the top of the boiler, being connected by a pipe to the bottom of the flue at the end farthest from the furnace, and at the top by two pipes to the front of the boiler. Under the bottom of the grate bars is a door to prevent the admission of air. The action of the furnace is as follows:—The coals are thrown into the hopper and moved forward by the moveable grates under the brick arch, which becomes intensely hot and cokes the fuel, and thence on to the bars, down which it is pushed slowly by teeth made of sheet iron, which, moved by an eccentric, rise and fall between the bars, thus accomplishing at one and the same time two objects—namely, to push the fuel forward and to stir it up and let the air pass through. By the time that the fuel has arrived at the bottom of the grate bars it is nearly all consumed, and what remains falls on to the bottom of the flue, whence it is periodically raked on to the firing floor by the attendant The water in passing through the grate bars is raised about 100 deg. in temperature." Mr. Fielden then states that:—"The furnaces have now been in operation at the extensive works of Messrs. Fielden Brothers for many years, and the result has been a saving in the consumption of fuel of at least 15 per cent., and there is scarcely any smoke made, and at the works of Messrs Potter and Co., Dinting Vale, Derbyshire, where 25 of the furnaces are at work, the saving of fuel has been no less than 25 per cent."

It is a matter of great surprise to us that an apparatus which, according to Mr. Fielden's account, works so satisfactorily, has not before this come into general use; for it is a well-known fact that large sums of money have been spent by various manufacturers, from time to time, for the prevention of smoke, but without any adequate result, for the evil has only slightly abated during the past few years.

A Novel Arch.

On the occasion of the opening of the new dock at Swansea by the Prince of Wales the whole town was decorated, and at night the principal streets were illuminated. It will be interesting to those in the wool trade to mention that among the many triumphal arches erected in honour of the occasion one of the most successful was raised by the enterprising firm of Parry and Rocke, woolstaplers, of that town. This novel arch was composed almost entirely of wool and of their Welsh yarns. The arch was erected across the principal thoroughfare in the town. It had the form of a castellated gateway of three arches. The two piers were built of bales of compressed wool, painted chocolate, with gilded hoops. The central arch was about twenty-two feet in height, the piers rising about ten feet higher, and ending in castellated turrets. The wooden uprights were covered with raw wool, bound with spirals of coloured yarns and enriched with a line of evergreens between them and the bales. In the centre on each side of the arch was a huge Prince of Wales plume worked entirely of raw wool and coloured yarns, the feathers being of raw wool, while the diadems were formed of richly-coloured yarns. The top of each pier was decorated with a large ornamental star formed of hanks of yarn of the richest colours, giving quite an oriental appearance to the whole structure. The whole of the central arch, and also those over the pathways, were covered underneath with designs in wool work. The arch, moreover, was adorned with appropriate mottoes and carried three large flags and a hundred small streamers of coloured yarns. On the bridge, when the Royal procession passed, sat four Welsh women in the national costume knitting.

THE GAZETTE.

Adjudications of Bankruptcy.

Kirkham Thomas, Harpurhey, near Manchester, cotton manufacturer, late Stalybridge.
Brookes David, trading as D. Brookes and Co., Ford Street, Leek, silk manufacturer.
Masterman Henry, Goswell Road, London, rug maker.
Scott Thomas, Eccleshill, Yorkshire, topmaker.

Liquidations by Arrangement or Composition.

Croydon James Hill, Aldermanbury and South Hill Park, Hampstead, lace warehouseman.
Ramsden James, trading as John Ramsden, St. John's Buildings, Little Horton Lane and Lansdowne Place, Little Horton Lane, all Bradford, reed and heald manufacturer.
Clayton Henry, Beech Avenue, New Basford, Notts., late lace manufacturer.
Cowburn James, Mount Mill, Sion Street and Mount Sion Road, Radcliffe, Lancashire, manufacturer of cotton goods.
Riley John Edward, Sloane Street, late Bishop Street, Moss Side, near Manchester, grey cloth salesman.
Lord James Herbert, trading as J. H. Lord and Co., Brook Street, Huddersfield, woollen merchant.
Travis George, trading as Mayall and Travis, Poynton, Stockport, and Fountain Street, Manchester, yarn agent.
Oddy William Atkinson, Town Mill Dyeworks, Rochdale, dyer and flannel merchant.
Place Joseph, West High Street, Salford, yarn agent.
Walcott John Frederick, Salop Street, Bolton, and Lever Grange, Great Lever, cotton merchant.
Cockroft Thomas, Millwood, Todmorden, cotton manufacturer.
Frith John and John West, trading as John Frith and Co., and as Frith and West, Chamber Mill, Hollinwood, Oldham, and Strutt Street, Manchester, cotton spinners and velvet manufacturers.
Mitchell Seth, Ings Mill, Ossett, woollen cloth manufacturer.

Trustees Appointed.

Storey James, trading as James Storey and Co. (Liquidation), Red Lion Street, Manchester and Eccles, skirt manufacturer. Trustee, J. Popplewell, Princess Street, Manchester, accountant.
Willans Thomas B., trading as Thomas B. Willans and Co. (Liquidation), Rochdale, flannel manufacturer. Trustee, T. W. Gillibrand, George Street, Manchester, accountant.
White Greenwood, trading as Greenwood, White and Co. (Bankrupt), Hewenden Mills, near Bingley, Yorks, stuff manufacturer, trustee, B. Musgrave, Bradford, accountant.

Dividends.

Crosier Charles, trading as Charles Crosier and Co. (Liquidation), Friday Street, Cheapside and Malvern Road, Dalston, mantle cloth merchant. 1st dividend, 12s. 6d.; Tribe, Clarke and Co., Moorgate Street Buildings.
Lomas William, trading as W. Lomas and Co. (Liquidation), Great Ancoats Street, Manchester and Levenshulme, skirt manufacturer. 2nd dividend, 2s. 8d.; E. Groocock, 81, Warwick Street, Hulme, Manchester.
Palin James, trading as James Palin and Co. (Liquidation), Mosley Street, Manchester and Stockport, grey cloth agent. 1st dividend, 2s. 6d.; T. W. Handley, 52, Brown Street, Manchester.
Ryder John (Bankrupt), Nesbitt Hall, Pudsey, wool merchant, 1st and final dividend 2s. 1d.; W. Dufton, 14, Infirmary Street, Leeds.
Shackleton William H, John Tomlinson, and Holmes Smith, trading as Shackelton, Tomlinson, and Co. (Liquidation), Morton, stuff manufacturers. 1st dividend 2s.; J. S. Colefax, Bradford, accountant.
Samuels Henry (Liquidation). Faulkner Street, Manchester, and Brighton Grove, Rusholme, velvet manufacturer. 1st dividend 2s.; on and after October 28, between 10 and 3; W. L. Welsh and Son, solicitors, 52, Brown Street, Manchester.
Scampton Thomas (Liquidation), Wanlip Lane, Syston, Leicestershire, hosiery manufacturer. 1st and final dividend 6d.; M. A. Shadwick, Borridge Street Chambers, Leicester.

Bills of Sale.

Benn John, Leopold Street, New Leeds, Yorkshire, cloth manufacturer, for £70, to Richard Smith.
Booth Samson, 9, Mill Street, Heywood, cotton manufacturer, for £250, to B. Summersell.
Ingham R. H., Parker's Yard, Rutland Road, Batley, for £15, to Midland Loan Company.
Mathers Joseph. Burley Vale Mills, Kirkstall Road, Leeds, cloth manufacturer, indemnity to George Woollen.
Senior John, Green Mount, Dalton, Huddersfield, cotton spinner, for £10. to John Woolfe.
Walker Samuel. Grange Vale Mill, Lewis Street, Oldham, cotton spinner, for £9000, mortgage to John Charlesworth.
Cockroft Joshua. Burr Wood Mills, Holywell Green, Stainland, Halifax, worsted spinner, for £300, to Thomas W. Cockroft.
Drake Wilkinson, 10, Trinity Road, Halifax, waste dealer, for £60, to John Ainley.
Howard William Sudbury, 17, Shipstone Street, Scotholme, New Basford, Nottingham, lace maker, for £22, to R. W. Bailey.
Walker Samuel, Grange Vale Mill, Oldham, cotton spinner for £3,000 mortgage, to Thomas Thorborn and another.
Wood Alfred, 20, Dean Street, Lindley, and Quarmby Mill, Huddersfield, commission weaver, for £26 10s., to John Woolfe.
Mellor Edmond, Wilton Terrace, Rhodes, Lancashire, bleacher, for £50 to James Shorrocks.
Mills Thomas, Rose Mills, Wigan Road, Rumworth, Bolton, sponge cloth manufacturer, for £80 4s. 9d. to James F. Mills.

Dissolution of Partnerships.

Brown T. A. and Co., Holmfirth and Cloth Hall Street, Huddersfield, woollen manufacturers. Debts by Tom Abraham Brown.
Farrar J. and Co., Sowerby Bridge, Yorks., woollen manufacturers.
Fenwick and Co., Abchurch Chambers, Abchurch Yard, London, and trading as W. Crosby and Co., at Hobart Town, Tasmania and Melbourne, Victoria, merchants. Debts by C. R. Fenwick.
Field J. C. and J., Lambeth Marsh, Lambeth, West Moulsey and Bermondsey New Road, wax chandlers, bleachers and soap manufacturers. As regards John Kingsford Field.
Fisher and Co., Huddersfield, commission agents, and trading as M. Fisher, Sons and Co., Montreal, woollen merchants. As regards John Fisher.
Sykes and Co., Huddersfield and Brookholes, near Huddersfield, Yorks., woollen cloth manufacturers. Debts by Joseph Sykes.
Adam Walton and Co., Monkwell Street, London, trimming manufacturers.
Bancroft and Co., Oxenhope, Yorkshire, worsted spinners.
Smith and Gunn, Nottingham lace makers.
Smith and Sons, Horton, Bradford, worsted spinners.
Taylor and Co., Long Eaton, lace manufacturers.

PATENTS.

Applications for Letters Patent.

4327. Carl Dawerdt, Berlin, Germany, "Making silk rags into silk shoddy."
4338. John Leeming, Bradford, machine maker, "Improvements in looms for weaving.
4348. George Kirk, of the firm of Schofield and Kirk, Huddersfield, machine maker, "Improvements in looms for weaving."
4353. John Tatham, of Rochdale, machine maker, "Improvements in machinery or apparatus for preparing wool, cotton, or other fibrous materials."
4358. Joseph Bayley, Ashton, and Thomas Bayley, Stalybridge, cotton spinners, "Improvements in or applicable to machines for opening and cleaning cotton."
4387. Robert Riley, Keighley, designer, "Improvements in apparatus for regulating healds and warp threads for weaving."
4399. John Leadbeater and Alfred Leadbeater, both of Morley, iron and steel merchants, "Improvements in the method of and apparatus for feeding wool and other fibres to scribbling and carding machinery."
4406. Thomas Thorpe, New Basford, Nottingham, manufacturer and machine builder, "Improvements in machinery or apparatus for the manufacture of knitted or looped fabrics."
4422. Thomas Briggs, of Manchester, "Improvements in the construction of machinery or apparatus employed for spinning and doubling yarns or threads."
4432. James Barbour, Belfast, Ireland, machinist, "Improvements in looms for weaving." A communication.
4457. Thomas Graham Young, Penicuik, Midlothian, North Britain, "Improvements in bleaching jute."

4460. James Lee Norton, 150, Piccadilly, Middlesex, engineer, "Improvements in machinery, apparatus, or means for tentering, stretching, and drying fabrics, and in drying other materials"
4464. William Terry and John Scott, Dudley Hill, Bradford, commission wool combers, "Improvements in machinery or apparatus for combing wool and other fibrous substances"
4465. Joah Lodge, Huddersfield, manufacturer, and Mark Oldroyd, Dewsbury, manufacturer, "Improvements in machinery for stretching and 'winding on' woven fabrics and for removing the creases and ridges therefrom"
4466. Walter Dexter, Nottingham, "Improvements in warp or straight bar knitting machines and in the fabric produced thereon."
4482. John William Naylor, Keighley, spindle and flyer manufacturer, and Thomas Thompson, of the same place, foreman, "Improvements in flyers employed in spinning and twisting fibres."
4484. Robert Scaife, Colne, Lancaster, spindle maker, "Improvements in machinery or apparatus for spinning and doubling or twisting cotton, worsted, silk, or other fibrous substances."
4495. William Edward Gedge, 11, Wellington Street, Strand, London, patent agent, "Improvements in looms for weaving."—A communication.
4588. Carl Pieper, civil engineer and patent agent, 109-110, Gneisenaustrasse, Berlin, S.W., Prussia. "Improvements in fleece-dividers for carding machines."—A communication.
4613. William Hanson, in the employment of the firm of Sir Titus Salt, Bart., Sons and Company, Limited, Saltaire, Bradford, spinners and manufacturers, for an invention of "Improvements in looms for the manufacture of cut pile fabrics."
4621. Frank Wirth of the firm of Wirth and Company, patent solicitors, at Frankfort-on-the-Main, Germany, 'An improved device to be used as a reel or spool for holding thread."—A communication.
4686. John Imray, 28, Southampton Buildings, Chancery Lane, Middlesex, "Improvements in machinery for the manufacture of looped or knitted fabrics."—A communication.
4697. George Gordon de Luna Byron, Prince's Square, Brighton, Sussex, "Improvements in the production of elastic cotton, and in the means employed therefor."
4710. Oscar Drey, Manchester, "Improvements in the manufacture of certain woven fabrics."
4711. John Makin and Jabez Johnston-Ferguson, Bolton, "Improvements in figured fabrics, and in the method of weaving the same."
4713. John Makin and Jabez Edward Johnston-Ferguson, Bolton, "Improvements in weaving certain figured fabrics."
4715. William Robert Lake, of the firm of Haseltine, Lake, and Company, patent agents, Southampton Buildings, London, "Improvements in the manufacture of wax paper or cloth, and in compositions and machinery therefor, part of which machinery is applicable for other purposes.—A communication.

Grants of Provisional Protection for Six Months.

3612.	3718.	3730.	3758.	3784.	3794.	3842.
3850.	3874.	3892.	3896.	3900.	3905.	3914.
3918.	3962.	4015.	4047.	4056.	4071.	4129.
4131.	4213.	4215.	4353.	4387.	4389.	4399.

Notices to Proceed.

2415.	2556.	2571.	2713.	2720.	2727.
2736.	2972.	2773.	2794.	2837.	2863.
3178.	3262.	3553.	3726.	4015.	4215.

Patents on which the Stamp Duty of £50 has been Paid.

4040. Edward Gardner Colton, W. P. Thompson and Co's Patent Agency, 6, Lord Street, Liverpool, "Improvements in and appertaining to Machinery or apparatus for washing and cleaning wool and similar fibres, part of which is applicable to other purposes."—A communication."
4421. John William Lamb, manufacturer, and Samuel Lowe, machinist, Nottingham, "Improvements in knitting machinery."
3952. Alexander Melville Clark, Chancery Lane, Middlesex, patent agent, "Improvements in gig machines for napping cloth."—A communication.
4054. Benjamin Alfred Dobson, of the firm Messieurs Dobson and Barlow, Bolton, machine maker, and William Dobson, and Robert Crompton Tonge, both of the same place, engineers, "Improvements in self-acting mules for spinning and doubling."
4166. John Stordy and Frederick Hampson, both of Manchester, "Improvements in the construction of stoves for singeing fabrics."
4176. Francis William Ashton, of Hyde, Chester, calico printer, and Wm. Mather, of the firm of Messieurs Mather and Platt, of Salford, engineer, "Improvements in machinery for washing fabrics."
4416. Charles Denton Abel, Southampton Buildings, Middlesex, "Improvements in combing machines."—A communication.
4106. Eli Wilkinson, Marsden, Huddersfield, "Improvements in apparatus to be employed in machinery for scribbling and carding wool and other fibrous substances."

Patents on which the Stamp Duty of £100 has been Paid

3519. Lucius James Knowles, Massachusetts, United States of America, "Certain new and useful improvements in looms."
3562. Robert Thornton, Cleckheaton, card manufacturer, "Improvements in wire card covering for carding wool, cotton, silk, flax, or other fibrous substances."
3601. John Chisholm, Oldham, machinist, "Certain improvements in mules and twiners for spinning and doubling."
4016. Thomas Stuart Kennedy, Leeds, "Improvements in machinery for preparing flax, jute, and other fibrous substances."
3632. Alexander Melvil'e Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in dyeing threads, yarns, and fabrics aniline black."—A communication.

Patents Sealed.

1634. William Morgan-Brown, patent agent, 38, Southampton Buildings, London, "Improvements in looms for weaving tufted fabrics chiefly used for carpets, rugs, and articles of that kind."—A communication.
1638. Thomas Holliday, of the firm of Read, Holliday and Sons, Huddersfield, manufacturing chemists, "Improvements in producing azo colours on cotton or other vegetable fibre."
1627. George O'Connor Holloway, Kidderminster, manufacturer, "Improvements in the manufacture of carpets and rugs"
3221. James Worrall, Ordsall, Salford, dyer, and John Kershaw, of Wadsworth, Halifax, manager, "Improved apparatus applicable to the scouring, dyeing, and washing of pile fabrics."
1689. John Erskine, Strabane, Tyrone, Ireland, "An improvement in spinning and twisting frames."
1722. William Lumb, Brotherod Hall, Rochdale, and James Smith, Higher Standrings, Bagslate, Rochdale, "Improvements in ring frames for spinning and doubling cotton, wool, silk, or other fibrous substances."
2603. John Clough, of Grove Mill, Keighley, spinner, "Improvements in the washing of wool and other fibres, and in the apparatus therefor."
1767. Ferdinand August Zimmerman, 21, Mincing Lane, London, merchant, "Improvements in the manufacture of dyes or colouring matters."
3208. James Higgins, Salford, machine maker, and Thomas Schofield Whitworth, of the same place, manager, "Improvements in machinery or apparatus for preparing cotton or other fibrous materials for spinning."
3503. John Henry Johnston, 47, Lincoln's Inn Fields, Middlesex, gentleman, "Improvements in preparing colouring matters suitable for dyeing and printing."—A communication
1772. Joshua Henry Wilson and Lawrence Wilson, Cornholme, Todmorden, bobbin manufacturers, "Improvements in and applicable to the bobbins and tubes used in spinning machinery and in preparing and doubling machinery."
1825. George William Clayton, Nutsford Vale, Manchester, "Improvements in the construction of apparatus for 'padding' colours on to calicoes or other woven fabrics"
1821. Francis Sagar Witham, Nelson, near Burnley, gentleman, "Improvements in looms for weaving."
1855. Ralph Clegg, mechanical draughtsman, and James Taylor, mechanic, Oldham, "Improvements in machinery or apparatus for preparing, spinning, and doubling cotton, wool, silk, and other fibrous materials."
2055. Edward Wilson, Preston, pattern maker, "Improvements in looms for weaving."
3522. Arthur Paget, Loughborough, Leicester, "Improvements in knitting machinery."
1878. Malcom McCallum, Barrhead, Renfrew, North Britain, engineer, "Improvements in apparatus for finishing woven fabrics."

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372,029-31. H. R. Willis and Co., Kidderminster.
372,084-87. Cooke, Sons and Co., London and Liversedge, Yorkshire.
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372,004. Beith, Stevenson and Co., 14, Bridge Street, Manchester.
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ILLUSTRATIONS.

An Original Design for a Toilet Quilt.
An Original Design for a Carpet.
An Original "all over" Design
Asquith's Self-acting Slotting Machine.
Pratt's Patent Velomotor.

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The American Tariff Convention.

It would be interesting to learn on what system of political economy the present fiscal policy of the United States is based. It would also constitute a very curious psychological enquiry to endeavour to ascertain if there is such a thing as a national conscience in America. The proceedings of the New York Tariff Convention would seem to answer the first enquiry by the suggestion that if any economic system exists at all in that country, it is one of political economy gone mad; and, in the second case, that if there be a national conscience at all, it has certainly become dormant. We might observe, further, that if there be such a thing as sublime selfishness, the Yankees have certainly obtained possession of it.

An inspection of the imports and exports of the United States shows that natural productions in the form of bread stuffs and raw cotton constitute the principal of their exports; and that their chief imports are sugar; coffee; wool, raw and manufactured; iron and steel, raw and manufactured; silk, raw and manufactured; chemicals; cotton, raw and manufactured; skins; flax, raw and manufactured; tin, raw and manufactured; tea; fruits; and copper, raw and manufactured; in the order in which they stand. The first begins with 88¾ million dollars, and the figures gradually diminish, until the last quoted is measured by 12¼ millions. These are the figures of 1880. In reference to wool and woollen manufactures, one of the Convention orators boasted that in Philadelphia alone this industry employed 200,000 hands, and consumed no less than 150 million pounds of wool. No doubt, there would also be found other eloquent expatiators on the steel and iron production, which have unquestionably attained to a still larger scale of development, and so the "long bow" would be kept in vigorous action. After all this, the simple-minded looker-on would naturally turn to the existing tariff, which dates from 1874, in the expectation that these shrewd men of business would, as a matter of course, take care that free ingress was afforded, at least, to the raw material consumed by themselves in their industrial pursuits. But if such a reference were made, he would be not a little surprised to find that clothing and combing wools in the raw state are subject to a custom's duty of from 10 cents per lb., and 11 per cent. *ad valorem* in addition, to 12 cents and 10 per cent. while carpet wools bear a duty of from 3 to 6 cents per lb.; noils paying the same duty as the most expensive wools. On turning to steel, the enquirer would see that bar steel is called on to pay an admission duty of from £10 to £16 sterling per ton; and bar iron from £4 10s. to £7 per ton; and even iron ore pays 20 per cent. *ad valorem*. It is fair to say that tea and coffee are imported free, but sugar pays from 1¾ cents to 4 cents per lb.; but when we come to anything in the shape of manufactured goods we are compelled to wonder. Woollen cloths and shawls are subject to a tribute of 50 cents per lb., and 35 per cent. *ad valorem*; and worsted and alpaca goods pay from 20 to 50 cents per lb., and the 35 per cent. in addition also; knitted goods and woollen yarns being liable to the same duties as this last named class of goods. Printed cottons, 5½ cents per square yard, and 20 per cent, and cotton yarns from 10 to 40 cents per lb, plus the same 20 per cent., and so on *ad infinitum*. We venture to affirm that the aforesaid looker-on would find himself a wiser, if not a sadder, man after his perusal of this tariff of our American cousins, and that he would not be long in arriving at the conclusion that much unwisdom displayed itself in the construction of such a document, not to mention the present demand for still further aggravation of its conditions, because he would reflect that not only do such restrictions as are here displayed contract the supply of the first necessaries of civilised life, but also must hamper the manufacturer either by increasing the first cost of his raw material, or in having the effect of limiting his supplies, or both. But this reflection suggests a partial explanation of the anomaly. The duty on wool is a sop to the agriculturist, whose interests are undoubtedly sacrificed to those of the manufacturer to a large extent In like manner there is a duty of 10 cents and 20 cents imposed on all imports of corn and wheat respectively. But fancy corn or wheat being imported into the United States, when they are exporting something like 60 millon pounds' worth of those commodities in one year!

Then, what about the amenities of international intercourse? England stands first on the list both of customers and of those who minister to the wants of the United States. She receives, without exacting one penny of import duty, all the manufactures and raw materials that America and all other countries may choose to send, as well as all articles of food, with the exception of a very limited number, on which it is necessary to raise some portion of our national revenue. What this means, as regards America, can only be understood by putting down the actual quantities sent by her in, say, 1880; and these are—of raw cotton, 1,224,282,304 lb., and of grain of wheat, 36,190,814 cwts; of flour, 6,873,829 cwts.; of barley, 328,345 cwts.; and of oats, 57,804 cwts.; while, on the contrary, almost every pound of what we send to America is heavily weighted with entrance duties, in some cases to the extent of their full market value when they leave our shores.

The force of selfishness—and that short-sighted selfishness—could not be more egregiously displayed. The ill-temper and sore feeling that are barely slumbering, and are but ill-concealed, both in this country and all others with whom America transacts business, will one day manifest themselves in some, at present, unexpected manner as surely as this ill-conceived policy is persisted in; and if we were to venture on a word of counsel to Brother Jonathan, it would be to exhort him to act more in accordance with the traditions of American freedom. Comparing 1784 with 1874, the contrast is in favour of the former in respect to American commercial freedom; and the *regime* inaugurated in the latter year are as likely to give rise to a tribe of "Mohawks" as was that which preceded the former. What if such were the case?

Among the new dress fabrics is the "Patria" cloth, a serge-like material, warm and light, and likely to drape well, published as made of British wool, and appealing thus to the sentiment aroused by Lady Bective. A decorative label in Kate Greenaway style—a style by the way with which the public must be nearly satiated—accompanies the dress lengths.

Technical Education in France.

The Commissioners on Technical Education have again returned to England, having visited a large number of Technical Schools in France and Italy, and having collected a quantity of very interesting facts during their labours. In both countries they have found that full advantage has been taken by artisans and others not only of the opportunities afforded them by their respective Governments, but also of the endowments not connected with the State, to acquire a thorough technical education. Mr. Swire Smith, one of the Commissioners, in a letter to Mr. H. Mitchell, the President of the Bradford Technical School, has given some very interesting details of the working of the schools in France. After visiting Paris, Rheims, Chalons, and other cities and towns, he writes :—"Our inquiry, as it proceeds, becomes more and more interesting, because at each step we find great educational activity in every district, prompted by the two-fold desire to raise the intellectual standard of the people, and to increase the value of their industries. In fact, to a degree that we have not dreamt of in England, the French seem determined to make every class of industry more effective and profitable.' All elementary schools in France are free, and the children, in addition to the ordinary subjects of education, are taught, in a systematic manner, drawing, modelling, and the use of tools, workshops containing the necessary apparatus being attached to the schools. In one school at Rheims—free to those passing the entrance examination,—in addition to a high-class commercial and scientific education, the boys work at the bench or lathe for five or six hours a day, executing work of a high-class kind in the shape of tools, small steam-engines, telegraphic instruments, and wood work of various kinds. When they leave school, at sixteen or seventeen, they are almost invariably able to take situations equal to those of young men who have gone through a regular course of apprenticeship. Mr Smith then alludes to the free evening schools which are to be found in every district in Paris, and in nearly every town throughout France, in the following words :—"In Paris there are at least 100 evening drawing schools open and free to all comers. In most of them the students are not even required to find materials. The municipality offers comfortable rooms, welcoming rich and poor alike, high-class teachers, and the best models in the world, and only asks that those who come shall work and reap the reward of their labours. A few evenings ago I entered one of these free drawing schools along with some of my colleagues, and found 300 students, all of whom were workmen engaged during the day in earning their bread. In one room I counted nearly 100 engaged in drawing from models and copies of an elementary character. The students were so closely packed that it was impossible for them to work with comfort. A class of about forty were engaged in mechanical and architectural drawing. The teacher pointed out amongst them masons, joiners, mechanics, engineers, millwrights, forgers, watchmakers, &c., in fact, in the various class-rooms the director said that almost every trade in Paris was represented. In one room over twenty students were modelling in clay from classical figures. In another room nearly forty were drawing from similar antique models. What impressed us most was a life-class, a study of the nude human figure by thirty-eight students, who were arranged in three semi-circle rows behind each other, and prosecuting their study with the greatest possible earnestness. Behind these were fifteen students modelling from the same figure in clay, and I shall not soon forget the pespiration which ran down the faces of many of these students, so imbued were they with the excitement and enthusiasm of what may be called artistic inspiration.

"We have visited several of these evening schools in different parts of Paris, without any pre-arrangement whatever, and therefore I conclude that what we saw may be taken as an average, both in attendance and merit. I have myself visited three schools in which students were drawing and modelling from the nude figure. I can give no better evidence of the advanced instruction that is being imparted to such large numbers of the artisans of Paris.

"In these schools there is no attempt at teaching design as applied to any particular industry, The students are taught to draw and to model; the principles of artistic form, colour, and design, are taught from the highest of all models; the students make the applications for themselves."

The system adopted by France is no doubt a most costly one to the State; of that the people are well aware, but they ask themselves the question—"How are we to compete with other countries unless our artisans are thoroughly educated?" England might well ask herself the same question. If we are to keep pace with France and other countries would it not be well to adopt a similar system of technical education?

"We find people," says Mr. Smith, "constantly proclaiming that the Englishman is deficient in the art faculty, and that the art faculty is the natural possession of the Frenchman." We thoroughly agree with the writer when he remarks—"I believe that the art faculty is as prominent in the Englishman as the Frenchman when it has the same chance of development." . . . . Parisian children are taught to draw and to model, and as they advance in years they have free tuition of the highest character offered to them, and which their preparatory training encourages them to pursue; then they have the advantage of models, copies, and studies in museums and galleries such as English artisans never even saw; it is not to be wondered at that the Frenchman surpasses the Englishman in that happy blending of beauty with utility which is one of the chief characteristics of his work.

Mural Decorations of the Manchester Town Hall.

Mr. Ford Madox-Brown is now at work upon the fourth panel in the Great Hall of the Manchester Town Hall. For each of the previous pictures the artist prepared an elaborate cartoon, in which everything except the scheme of colour was faithfully set down. On the present occasion he has departed from this mode of procedure and is working direct on the wall without the intermediation of a large cartoon. The subject is one which connects the rise of the great textile industries with the mediæval history of Manchester. The artist shows Queen Philippa, of Hainault, with her ladies, riding down the streets of a town in which have been settled a number of Flemish weavers, the products of whose looms are being shown for the admiration of Royalty. It will easily be imagined that this scene is one which will lend itself to ths picturesque and symbolic treatment so markedly characteristic of the work of Mr. Ford Madox-Brown. The picture is not in any literal sense a scene from the history of Manchester, though the fortunes of the town doubtless received an impetus from the introduction of the Flemings, who are believed to have settled in England under the protection of Queen Philippa.

It would be premature to enter upon any detailed examination of the artistic qualities of Mr. Brown's latest picture, but it is gratifying to know that the work is proceeding to a satisfactory conclusion.

The Cotton Trade.

Judging from the results of limited company stock-takings, the Oldham cotton trade may be said to be in a satisfactory position. The dividends declared range to a considerable figure, and there are protestations that these are in many cases the results of legitimate trading—not speculation in the raw material. In connection with the new mills that are now in progress in the Oldham district, it is remarkable that there should have been such a fall in the price of machinery within the past few years. When the spinning power of Lancashire was being increased some few years ago, about 1875, textile machinery reached perhaps its highest figure. It was not unusual for mills to cost from 28s. to 35s. per spindle, fireproof throughout, although in one notable case a non-fireproof mill cost 35s. per spindle. At the present time a large fireproof concern, estimated to contain some 70,000 spindles, will be completed at a cost, it is calculated, of 22s per spindle.

Art applied to Textile Fabrics.

BY LEWIS F. DAY.

(*Continued from page* 25).

Panelled curtain-patterns have been common of late years, but it is doubtful whether a panelled arrangement is at all the best for a curtain design. The horizontal lines in it are valuable, the perpendicular are wasted, and the panel itself is never seen in its entirety. This last defect seems to be singularly at variance with the very notion of a panel. Nevertheless it is not a bad principle of design in Textile Fabrics to adopt such a scale of design that the pattern is not comprehended at a glance, only an effect of broken colour being seen without any of the mechanical precision of pattern which is the danger to which modern manufacture is prone. This principle is observed by the Turks and by the Indians in most of their carpets, where the pattern is often of a tolerably rigid kind, but so large in scale that in a room one never sees enough of it at a time to become tired of its sameness. It was observed, too, in the brocades and velvets of the fifteenth and sixteenth centuries, even when they were intended for the purposes of costume. One is familiar with many an old German, Flemish and Italian picture in which the half of a single rosette or pine-cone is all the pattern for which there is room on the ample sleeves of the period The tradition of those large designs has come down to our own times, and we still produce one-coloured damask patterns of this character; but we have not the courage to design such patterns in more than one tint. For all that, it is a good principle; but our practice of submitting small samples is against it. In the sample such designs only scare away the purchaser.

The Persian principle of smallish patterns very much broken up, is in Persian hands admirable; but without some scheme of stripes, either horizontal or diagonal, such as they adopt, it is likely to lead to monotony. It is well enough to produce by an infinite number of bits of bright colour the effect of a glow of monotone, but unless that monotone be more beautiful than could have been produced with a single dye, it is not worth the pains.

The adoption of a rich border round the edge of the curtain is effective, but if that border is to be restricted in its variety by the consideration of the more simple manufacture of the field or filling, it would be better to manufacture field and border separately, and leave it to the upholsterer to make them up. The broad border at the bottom expanding into a kind of dado is ill-advised in as much as in it the labour is spent just where the effect is least appreciated.

A common mistake in tapestry curtains of the panelled or bordered kind is to introduce into them too great a contrast of colours. Every opportunity appears to be seized of bringing in a bit of bright colour, the brighter, the better, because it ensures that it shall be noticed. These bits of brightness may be just what sells the curtain. I offer no opinion as to the mercantile merit of harsh colour,—but in an artistic sense they spoil the curtain, and unfit it for use in decoration. The best curtain may not be the curtain that sells best. But a curtain is after all only part of the decoration of a room, and if it will not fall in with an artistic scheme it is not of much account as art. In the sale-room it may be a merit in a curtain if it call attention to itself, but in a tastefully arranged dwelling-house there is no room for such a self-asserting piece of goods. "Thirty millions, mostly fools!" said a recent philosopher. The manufacturer may fancy that the millions are mostly vulgar; and he may be right or wrong; but let us hope that there is a public for the taste that is not loud. The best of course is only appreciated by the very few; but I believe that the manufacturer makes a very great mistake in lowering the standard of his productions to the level that he *imagines* to be required by the public. The public would accept a better thing quite as readily, if not more so. Where he has attempted something better than usual and missed the public, it is usually because he has not done it well enough, or thoroughly enough. He has spoiled it by adding the sop that he thought necessary to vulgarity. Compromise is here of no use. If you determine to appeal to the common love of crudity you must do so deliberately and without reserve; if on the other hand you would appeal to those who know better, you must not be afraid that anything will be too good for them. You cannot well catch two publics with one bait, but you may easily miss both of them.

Cotton Goods in China and their Adulteration.

It is still found necessary by Her Majesty's consuls in China to draw the attention of manufacturers of English cotton goods, to the great injury being done to our trade with that country, by the excessive sizing of their manufactures. There have been reports lately that English trade in China has not, in fact, been so much injured, as was represented some years ago, by this malpractice, and that the evil was much exaggerated; but the report just issued by the Foreign Office, would seem to show that the cause of the complaints has not yet been removed As English trade goes on steadily increasing in all directions it may be assumed that there is another side in respect of all such complaints, and that along with these malpractices there is plenty of good business to cover them and make them remunerative; but the matter should undoubtedly receive the attention of those concerned. Much disgust is expressed at the excessive sizing of English manufactures, which reaches 30 per cent. of the total weight in ordinary cases, and 40 per cent. in the case of drills. American drills are said to be quite free from adulteration. The sizing of the English goods was at first starch, or similar vegetable matter, which it was found bred weevils or other insects of that category in the cloth; now they have substituted a kind of pipeclay, which produces rot in the place of insects. English goods are therefore chiefly used for funeral purposes—where showy presents must be made, and where large quantities of material are required for ephemeral purposes—and for the linings of wadded or double garments. The dress of the common people is invariably blue-dyed native cloth, which washes well, and is both warmer and infinitely more durable than the English fabrics. Sz. Ch'uan does not produce sufficient for its own use, and imports large quantities from Hu Kwang, a region which sends large consignments also into Yun Nan and Kwei Chow. The five northern provinces are supplied with the balance of what they require from Kiang Su. The natives anticipate a time when the factories now in embryo at Shanghai will entirely drive the foreign cloth from the market, especially if the present adulteration goes on. They admit that their own shortsighted yet persistent demand for a cheap but rubbishing article has betrayed the foreign manufacturer into indiscretion, yet they add that the spectacle of such wholesale adulteration produces an evil effect and lessens the general confidence in foreign excellence. Mr. Hughes, writing from Shanghai, quotes from Mr. Maclean's "Annual Retrospect," in which it is said that mildew has been steadily lessening in recent years. The natives still continue to buy "filled" goods, for there are uses to which they are put and to which it would be folly to apply a more expensive article. At the same time "the consumptive demand for a pure or comparatively pure fabric is strengthening, and in the heavier textiles—drillings for instance—it made itself increasingly felt during the closing five months of the year 1880. Honest stuffs of American—and of Lancashire—manufacture were run after to the utter neglect, except in forced sales, of the adulterated, and whilst, now, stocks of the latter are in nearly everybody's hands, the place is almost bare of the former. Our manufacturers ought to be wise in time, and do their utmost to supply the Chinese market with a really honest article, and thus lay a firm foundation for future trade; for before many years elapse, there is not the slightest doubt but that they will have to compete, not only with American industry, but with that of the Chinese themselves.

When an art gallery was considered the greatest want in Birmingham, Messrs. Tangye's noble offer of £10,000 soon drew forth all that was required to provide one of the finest art galleries in the provinces; they have now offered £10,000 towards building a new school of art. An anonymous donor (who had previously given £10,000 to the school), at once promised another £10,000, which completes the sum required for the building. The land on which to build it has been presented by a great landed proprietor, Mr. Colmore. It is an admirable freehold site, in the centre of the town, opposite the new art gallery, with a frontage to three streets, and is valued at £15,000.

The Manufacture of Fabrics from the Fibres of Plants.

The Rameh Plant possesses qualities and merits of the highest value for textile industries. At the present time the cultivation makes great progress in Southern France, Corsica, and Algiers, and a practical process has lately been discovered for separating the fibres from the stems. The plant belongs to the nettle family, and although stingless, is similar to the stinging nettle in the form both of its leaves and branches, having, however, a much more luxuriant growth. The Rameh is a perennial, and not like flax and hemp, an annual, and its strength and fertility increases with its age; it withstands both drought and damp, but is very susceptible to frost Even after frost, however, it is only the first crop which is lost, since the roots, which penetrate the ground to the depth of about a foot, are seldom affected, and soon put forth new shoots Its growth is unusually rapid, and even in France it attains annually a height of from six to eight feet. In its home, however (China and Bengal), it attains the height of 15 feet. By cutting tho stems when they have attained a height of three feet, several crops and finer fibres are obtained, the plant renewing its shoots continually. The leaves, when dried, are valuable for the manufacture of the tough paper which is so extensively used in China. The cultivation of the Rameh is of the simplest kind, and with due care for frost, it may be planted at any season. It is maintained that the plant will yield a crop worth from £56 to £80 per hectare (2·47 acres); and assuming that three cuttings are annually obtained, there would be a yield of from 4,000 to 5,000 kilos. of leaves alone, which would cover all expenses of cultivation. In addition to this, there would be from 1,500 to 2,200 kilos. of fibres, from which 1,200 to 1,500 kilos. of linen could be spun. The tenacity of the Rameh fibre is 30 per cent. greater than that of flax, and in consequence of this tenacity, it has for many years been nsed in China in the manufacture of many articles, in which solidity is absolutely necessary. In China, from fibres of this plant the coarsest nets are woven, and fabrics which surpass in gloss and delicacy the finest battiste. The first operation is to separate the fibres from the resinous substance which unites them; this is effected by steeping in water. By the Belgians, large square cemented vats are used; in these the branches are laid, then water is poured on and kept from five to six days; to the water one-half per cent of the weight of the branches of pulverised charcoal is added, and the same quantity of carbonate of soda, or potash, and throughout the process the vats are kept carefully closed. In this manner decomposition takes place slowly, and the fibres are protected from the injurious effects of the exhalations of sulphureted hydrogen. After the gluten is dissolved from the fibres, they have only to be separated from the woody tissue; this is effected by hackling, which is performed by machinery in a very simple manner. The branches are passed successively through four pairs of rollers, which destroy the woody tissue; then the hackling is done by two pairs of grooved cylinders, which, by a movement backwards and forwards, rub and cleanse the fibres from all impurities; a third machine, which consists of a hollow cylinder, inclosing an axle, does the combing. This axle is provided with a number of whips, which beat the fibre continually; the fibres enter the cylinder at an opening in the side; the dust is removed by a ventilator, and the branches, reduced to the finest fibres, leave the machine perfectly cleansed, and after bleaching are ready for spinning. In consequence of the silky character of the fibre, it is necessary to fasten the warp securely to prevent its being pulled out when weaving. Special attention is also paid to the dyeing to ensure fast colours. In France measures have been taken for the manufacture of elegant Rameh stuffs on a large scale, either from Rameh for table cloths and furniture coverings, or mixed with wool and silk for draperies, and it is the opinion of those engaged in the manufacture of textile fabrics that the time has arrived when this material will play a great *rôle* in textile industries.

Another plant, possessing great merits as a textile or fibrous material, grows in Spain, and other southern countries, and is well known by the name of "Vivaz" It belongs to the family of the compuestas or sinanteras. This plant is also perennial, and grows wild. It commences and continues usually to grow beneath the soil without appearing above the surface, and its appearance is similar to that of a dry root. The plant can be grown in soil of any kind, but thrives best in soil of a clayey or calcerous nature. From the root grow stems of a conical shape, chiefly formed of, and surrounded by greenish membrances. Woolly white fibres surround these membrances, and as the stem developes, the fibres grow in proportion. The stems, when completely developed, become perceptible at the surface of the ground, without, however, rising above it, and the number of stems is so considerable that each plant is capable of producing from twelve to fourteen grammes of silky fibre. The plant produces a few leaves, which are covered by a membrane; their inner part, which surrounds a part of the stem, is covered with silky filaments. Their shape is irregular. The shoots are beneath the ground, that is to say, are formed at a level with the soil on the neck, where the stems expand, and where the silky covering is to be found. Messrs. Corral, Tejado, and Corbera, of Madrid, have lately patented in this country a process for obtaining and manufacturing a textile or fibrous material from the plant "Vivaz." The following is the method of treating the plant in order to produce the fibrous material:— The silky covering or filament described above is subjected to great changes of temperature, during which it is suddenly cooled aud heated; the vegetable material thereby becomes more and more fibrous, until it assumes the appearance of very fine cotton. When the plant has been brought to this condition it is submitted to the various processes of preparing, spinning, and weaving, as ordinarily applied to fibrous materials in general, and it may be used for all purposes to which fibrous materials are applicable.

The Paris Exhibition of 1882.

The Central Union of Fine Arts as applied to Industry is continuing its series of special exhibitions in Paris. It is arranged for the coming year to display the works of three great industries, which serve to embellish our houses, and are connected with our every day life. Wood, Paper, and Woven Fabrics are the three subjects in question. The outline of the Exhibition includes raw materials, apparatus for facilitating manufacture, and in many instances machinery in motion. Every pains will be taken to give such information as may be needed to make the display of real value, not only to those engaged in the various branches of industry, but also to the public generally.

There will be competitions besides the general Exhibition, and thus the undertaking will be of use, not only to the manufacturer, but also to the artist, by encouraging inventive genius in the different branches of the industries. The various subjects of competition are selected from grounds of practical utility, and thus the undertaking is likely to be of service from several points of view. By far the largest of the three classes of exhibits will be the department of woven fabrics. The first section will be devoted to raw materials, modes of manufactures and drawings and designs; the second will be set apart for carpets, tapestry, hangings and curtains of all kinds, table and house linen, &c.; the third to clothing—figured tissues, shawls and laces. Our contemporary the *Cabinet Maker* states that:—"The committee charged with the selection of tissues had so much work before them that they appealed to certain specialists, who gave valuable advice and hints. The tissue department opens with tapestry and carpets. As in many purely artistic creations, the processes of manufacture are of the most simple, and the credit of the work remains almost entirely with the weaver. In old days the great masters did not consider themselves beyond executing designs for the weavers of tapestry; things have greatly changed since those times. It was in 1662 that Louis the Fourteenth gave over the direction of the Gobelins institution to Lebrun, and between 1663 and 1690 there was no less than forty-nine prominent painters who had worked for the manu-

factory. The committee recommend the exhibition of a high-warp loom, such as is used at the Gobelins: this will be of special interest, it is thought, to the general public. At the Beauvais and Abusson and Felletin manufactories the weaving is effected on a low-warp loom, and it is to be hoped that work-shops, apart from those which are under national direction, will give the public the fullest opportunity of judging of their machinery. The carpet or *tapis de la Savonnerie* (so called because in the seventeenth century it was made in an old building at Chaillot that had served as a soap factory) is of soft pile, is finished by hand, is all in one piece, is made of all sizes, and reproduces the most complicated and most delicately-worked out designs. The short-pile carpets, which are manufactured at Aubusson and at Felletin, are by no means so pleasing to the eye. The number of stuffs used in furnishing is considerable: there are brocatelles, lampas, damask, velvet, plush, brocade, satin, &c., which are the boast of Lyons, Tours, Paris, Roubaix, and all Picardy; and there are woollen stuffs which are popular among certain classes. Lille has a speciality for linen; her white goods are remarkably fine, and her damask table linen unequalled, say some enthusiasts. From Rouen the French get their cotton goods now that they have lost Alsace, and from Rouen and Angers, in fact, all the northern departments of France, come the manufactures of which jute, and hemp, and horsehair, &c., are the foundations. The brocading and printing of stuffs are admirably effected in these days on silks at Lyons, on cotton at Roubaix and Amiens, on various materials at Puteaux and Saint-Denis; while the hangings and draperies, and curtains for bedroom ornamentation, are got up at St Quentin, Tarare, and Roanne; the coloured embroidery of these French goods surpassing the world-wide reputation of Swiss workmanship in this department. To all the furnishing materials will be added the cords, tassels, and gimps of the Paris *passementiers*, or makers of gimp trimmings, and the section will undoubtedly form a most interesting department." We append a classified list of the selections in the department for Woven Fabrics.

First Section.—Class 10. Raw materials, Jacquard cards, looms in motion. 11. Designs and artistic models.

Second Section, Furniture Goods.—Class 12. Tapestry and carpets. 13. Figured and printed tissues and hangings, in silk, wool, cotton, and other materials. 14. White curtains and table linen, figured and embroidered. 15. Embroideries, hand-made and machine-made. 16. Trimmings. 17. Decorative tapestry and ornamental arrangements of rooms, &c.

Third Section, Clothing.—Class 18. Figured tissues, or printed goods for clothing, in silk, wool, linen, cotton, &c. 19. Shawls. 20. Embroidery, hosiery and netting. 21. Laces, guipures, and tulles. 22. Made-up costumes, civil and military uniforms, church vestments, &c.

The special competitions will be arranged as follows:—

Furniture.—1. An ornamental *panneau* with decorative figures, $3\frac{1}{4}$ by $2\frac{1}{4}$ yards. 2. A flooring $2\frac{1}{2}$ by $3\frac{1}{2}$ yards. 3. Hangings, (*a*) Silk material for reception rooms; (*b*) Fancy tissues, figured or printed for bedrooms. 4. A white blind embroidered, 49 inches wide and $3\frac{1}{4}$ yards long. A tea service, cloth and napkin embroidered. 6. A complete boudoir, with chairs and hangings.

Clothing.—7. A figured or printed tissue for dresses. 8. A cross, in gold, silver, or coloured embroidery, for vestments. 9. A lace sunshade or fan. 10. A white embroidered dress for a child. 11. A *costume de visite* for a lady, wholly or partly made up, with trimmings. 12. A theatrical costume (*Don Juan*). With the exception of No. 11, all the competitions will be open to two forms of exhibits—designs by artists and works executed by the respective industries in question.

It is stated that prizes of an altogether novel form will be specially designed for the above competitions, and the display will be of interest to such of our readers as can run over to Paris during its progress.

Signor Orsini, secretary to the projected International Exhibition to be held in Rome, in 1885, has succeeded in forming a committee in London for the purpose of encouraging English contributions to the exposition. Committees are being formed in Manchester, Birmingham, Leeds, and Liverpool. The idea of an international exhibition at Rome has been received with much favour in England.

SCIENTIFIC AND ART NOTES.

Ladies in America are making their own Turkish rugs by drawing in rags, yarns, etc., into stamped Burlap patterns.

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By permission of the Queen, Mrs. McDowell is executing two copies of tapestry works in Buckingham Palace which were presented to her Majesty by Louis Philippe in 1848, and are in the private rooms.

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At the annual meeting of the Leek Art Classes, held recently, Sir Philip Cunliffe Owen announced that Mr. Joshua Nicholson, a silk manufacturer in the town, would shortly erect a free library, picture gallery, and art museum; and Mr. Nicholson, explaining his scheme, said that its cost would not be less than £10,000, and that he had arranged to contribute £500 annually until its maintenance was otherwise secured.

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To remove bolts that have rusted in without breaking them, the most effectual remedy that is known is the liberal application of petroleum. Care must be taken that the petroleum shall reach the rusted parts, and some time must be allowed to give it a chance to penetrate beneath and soften the layer of rust before the attempt to remove a bolt is made. In most cases a small funnel built around a stud or bolt end on the nut with a little clay, and partly filled with any of the searching petroleum oils and left for a few hours, will enable the bolt or nut to be removed.

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The Council of the Society of Arts are renewing their offer of a silver medal, together with a prize of £5, for the best label for plants, to be suitable for plants in open border. The Society's object in offering this is to secure a label which will not only be cheap and durable, but which will plainly show whatever is written or printed thereon. Competitors must send, not later than May 1st, 1882, specimen labels bearing a motto or number, together with a sealed envelope containing name of sender. The right of withholding the medal and prize is reserved by the Council, if, in the opinion of the judges, none of the specimens are deserving.

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The electric light appears to be working its way into use in some of the large manufactories in this country. Experimental lighting is daily on the increase. We learn that Messrs. John Crossley and Sons, of Dean Clough Carpet Mills, Halifax, have for some little time been making trials of the electric light at their extensive factories. Should this means of illumination be made of general use by a firm employing over 5000 hands, we have no doubt it will be an incentive for other firms to speedily follow. The experiments will be made under most favourable circumstances, as Mr. L. J. Crossley—one of the principals of the firm—a gentleman well known in the scientific world, will, we are sure—spare no pains to make the trial a success.

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Virginia has enough coal to supply the United States for 500 years to come, and yet her coal fields have scarcely been located. She has hundreds of miles of coal ranges which have not even been surveyed. Aside from coal she has mined over $2,000,000 worth of gold in the past thirty years, half as much silver, and has an inexhaustible supply of copper, lead, zinc, iron, granite, limestone, marble, plumbago, mica, glass-sand, fire-clay, salt, gypsum and marl. During the last two years her iron product has been booming, and as many as ten new blast furnaces have been erected. English capital has become interested in this business to the extent of millions of dollars, and new discoveries are being made weekly. Virginia is rich in iron alone, and the development of her other mineral resources will soon place her at the head in point of revenue.

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In the Dominion of Canada engineers appointed by the Government have been engaged for some time examining a proposed route for the construction of a canal that will complete, it is said, the chain of navigation in the midland districts of Ontario, and will extend from the head of Georgian Bay to the Bay of Quinte. It is claimed, that by barge navigation on this route, grain can be carried from Thunder Bay to Montreal in two and a half day's less time, and at a cost of five cents. less per bushel, than by the Welland route. The cost of the projected work is put at 3,000,000 dols., which, in the opinion of grain dealers, is a small sum to pay for a route, that during a large portion of the year, would ensure railway freights for grain being kept down to a low level.

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The Science and Art Department, South Kensington, have issued their new edition of the *Art Directory*, revised to August, 1881. Some important alterations and additions appear. The examinations of Elementary and Day Schools will be held from time to time, instead of annually in March, as heretofore. The disposition of the twelve gold medals in the National Competition receives an additional limitation from the definite award of one of them for a painting in monochrome, from the antique on a canvass 36 by 28 inches, which is evidently intended to encourage a large manner of working. It is also stipulated that candidates who have gained a gold medal may be required to pass an examination in the stage for which the gold medal has been awarded. Every gold, silver, or bronze medal is now to carry with it a book prize. There are several additions to the already long list of "stages" into which the work of the art schools is subdivided. The total number of Government Art Schools in the United Kingdom is 161.

ORIGINAL DESIGNS.

The first plate issued with this number represents a design for a Toilet Quilt of medium quality, (32 or 36 reed). The sketch is from the pencil of Mr. William Tait, of 34, Carter Street, Greenheys, Manchester; who, as a skillful designer of such fabrics, is well known in the Lancashire district.

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Great advancement has been made, from an artistic point of view, in Kidderminster Carpets during the past few years. Our second plate represents a design for a Carpet and Border of this class, the style of which is much in favour at the present time. The colouring of the body should be Sage Green Ground, Pale Peacock Blue Flowers, and Deep Terra Cotta Leaves. The border Black Ground, the flowers Peacock Blue, and the leaves Sage Green.

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On our third plate will be found an "all over" design of a very simple character, which might be suitably adapted for a variety of purposes, such as for Printed Blinds, Embossed Velvet, or Silk Damask.

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*** We beg to inform manufacturers and others that adaptations of designs, published in the "Journal of Fabrics," can be made at the Office by experienced Designers, and that Original Designs can also be furnished at moderate charges.

MONTHLY TRADE REPORTS.

Wool.—The Colonial Wool Sales in London commenced on the 22nd ult and have been marked by great activity, prices have advanced on those paid at the last sales from five to ten per cent. Only about one-third the quantity sold has been taken for export. At the Liverpool Sales which closed on the 30th ult., a slight advance was made in prices. At Edinburgh and Glasgow an active demand for wool during the whole month has characterised the market, although there has been nothing approaching excitement. Prices are a shade higher. In Leeds a fair demand has been experienced, with an advance in rates, consequent upon the advance of the raw material at the sales. In Bradford and Halifax business has been rather of a dragging nature, but prices are, however, well supported by the country rates and the sales, and there is a general confidence in future prospects of business. The yarn trade has improved considerably during the month, confidence in the stability of prices seems to be growing.

Cotton.—At the begining of the month a fair amount of activity distinguished the market, but towards the latter end, business fell off, but without making much difference in prices. In the yarn and cloth market prices have fallen slightly. There has been a fair demand for India and China, but at very low prices. The season has so far been a good one for velveteens.

Woollen.—During the month, the trade has shown again a considerable amount of activity. Mills that have for some time being closed, are being re-opened; and working overtime seems to be the general rule. Prices have advanced in sympathy with the wool sales.

Silk.—A fair demand both for the raw material and manufactured goods has been experienced and rates have been fairly maintained. A more hopeful feeling prevades the market.

Linen.—The market has kept fairly active during the month in the manufactured articles; yarns have been slower of sale, prices have been well maintained, and in many cases advances have been made. Some few orders are in hand for the United States, but the foreign trade is, on the whole, still quiet. The home markets continue very favourable.

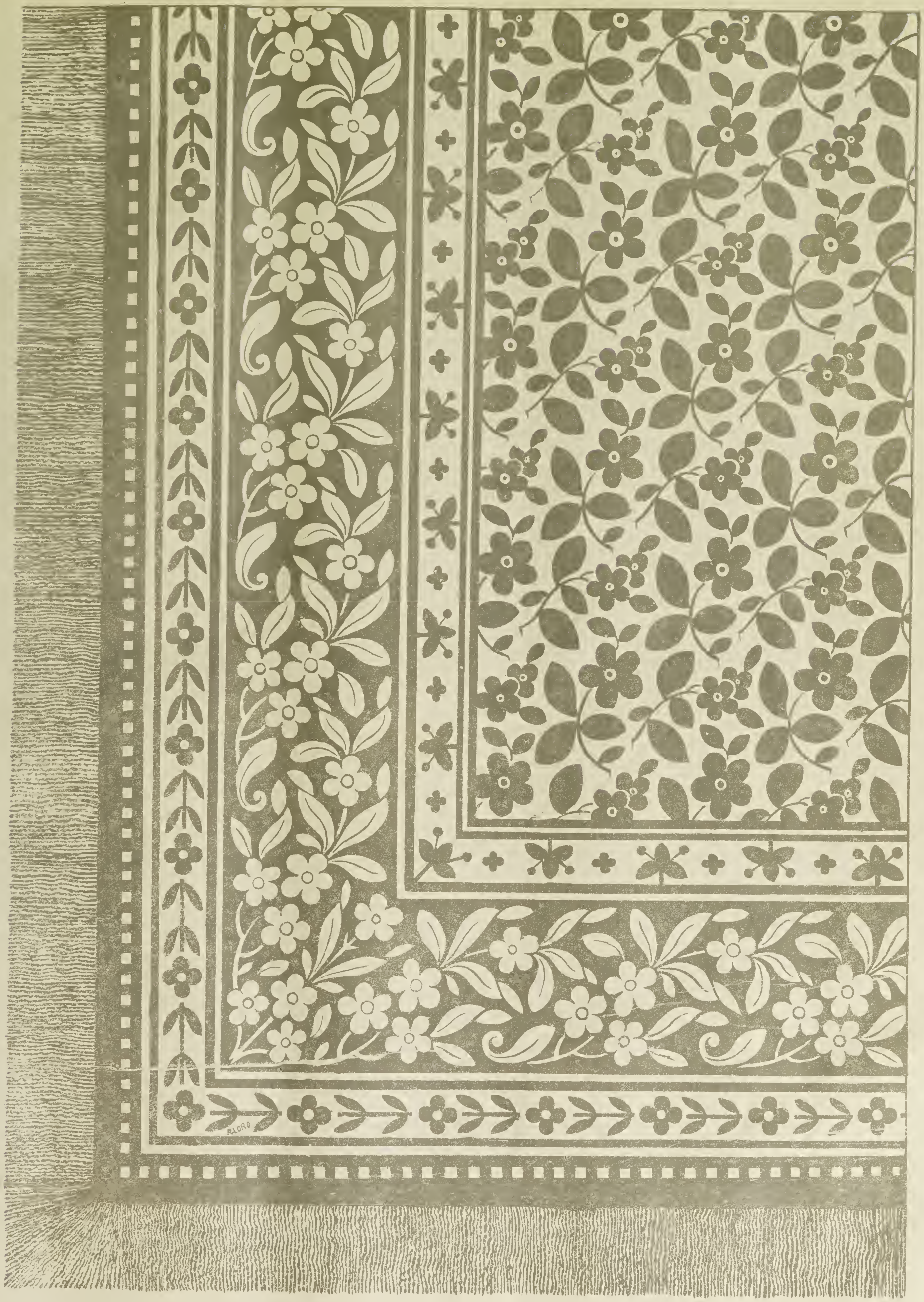
Carpets.—A more healthy state of things exists in the carpet industry than has existed for some time past. The firm stand made by the manufacturers for more remunerative prices has been maintained. Business has improved considerably, and all hands are employed. It is a great satisfaction to manufacturers to know that they are now working at a profit Spinners are all busy, and show no anxiety for fresh orders. In the rug trade things are more hopeful.

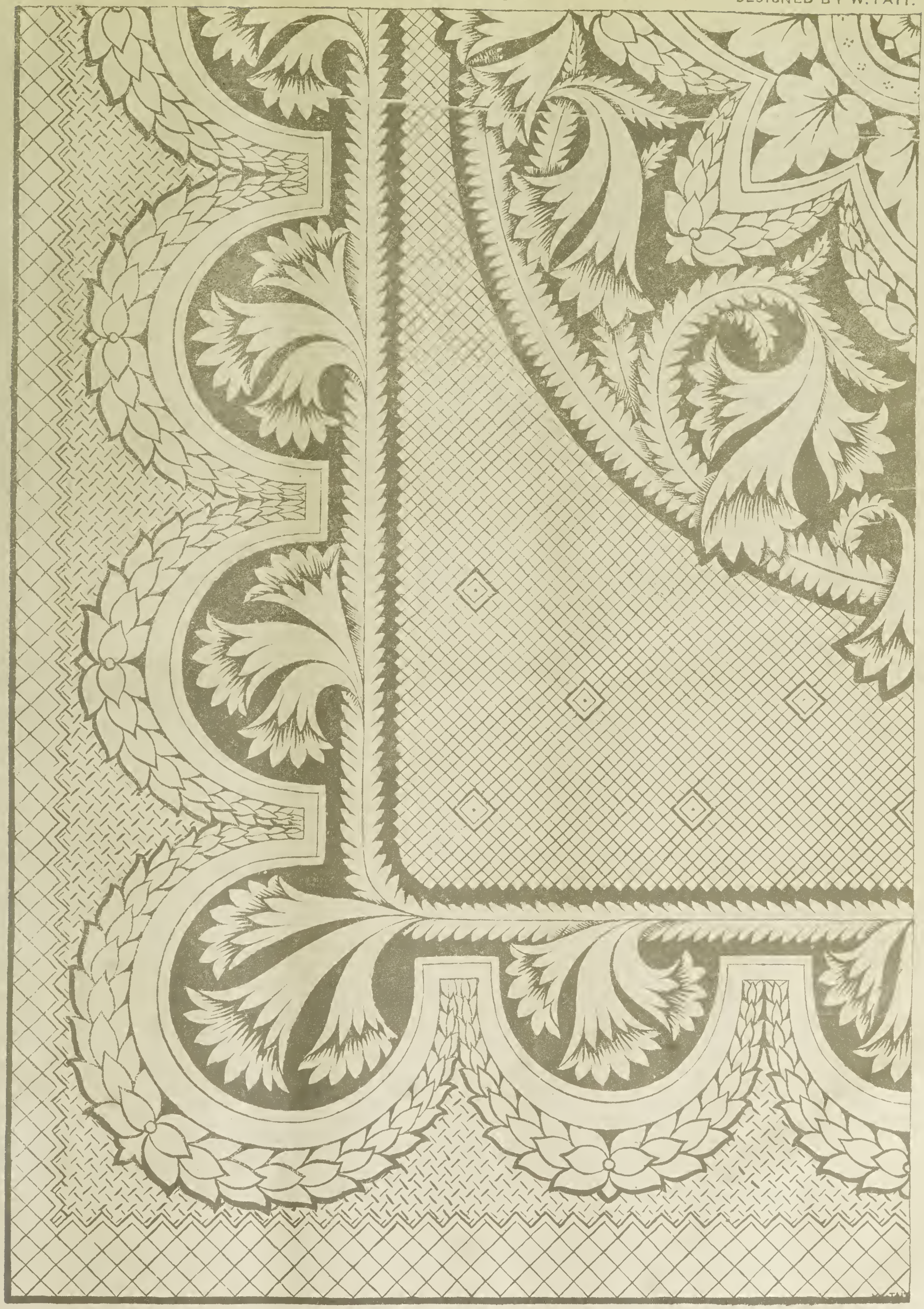
Lace.—This industry still continues active—especially in the cotton department Curtain machinery is kept busily employed, large orders being still on hand, not only for heavy goods but also for smaller articles. Prices are very firmly maintained. The foreign trade is especially brisk,—large orders having been received from the United States and the Continent. In the home department there is, it is true, no pressure of new orders, but still there are sufficient of the old ones to keep manufacturers employed for some time to come.

The Decline of the Coventry Ribbon Trade.

It has been estimated that before 1860 the Coventry Ribbon Trade amounted to two and a half millions annually; this, it is believed, has dwindled to about half a million. The annual return of minor industries connected with the trade—trimmings, furniture, lace, &c.—is probably £100,000 more. In 1859 our import of silk ribbons amounted to £517,679; in the same year velvet ribbons to the value of £611,415 were imported; but these did not compete with the Coventry trade, and the demand for them has since died out. In 1869 our purchases of foreign silk ribbons amounted to nearly three millions—*i.e.*, to £2,779,532 The disorganisation of Continental industry caused by the Franco-German war produced a marked decline in these figures, which for 1871 and 1872 stood at £1,467,531 and £1,483,828 respectively. By 1874 the trade had risen to £2,076,744: it is now (1880) £2,033,520; this slight decrease is due to a decline in values, and not in quantities. As might be expected, the pressure of competition has made itself felt in the quality of Coventry ribbons; the advance in this respect has been very marked. The trade, however, gives no signs of permanent revival, and it is not animated by any spirit of hopefulness As at St Etienne, the manufacture is principally carried on in the houses of the weavers, who of course own the looms. The last thing an intelligent weaver thinks of is to bring up his son to the trade; the hands are for the most part women, and men whose occupation was determined in better times. The foreign rivals of the Coventry ribbon trade are the French and the Swiss—the artisans of St Etienne and Bâle. The chief pressure of competition is from Bâle, where the factory system prevails more than at St. Etienne; the class of goods is also cheaper. It may be said, if not without fear of contradiction, at least with confidence, that at both places the trade is conducted with a skill and science unknown in England. It is a commonplace of the English ribbon trade that the cue of fashion comes from abroad, and the commercial significance of this fact is obvious Longer hours and cheaper labour must also be reckoned among the causes of this successful rivalry.

Although England, Germany, France, and America are moving with great strides in electrical development, France had the honour of being the first to employ electricity for the transmission of power. The St. Cloud shaft at Blanzy was sunk to the depth of 500 metres (1640 ft.), for the purpose of searching for a faulted portion of the coal seams, and a heading was run from it across the strata. When this heading had reached a length of 400 metres (1312 ft.) the ventilation became so poor that the temperature at the face rose to 95 deg. Fah., and the miners could work only for a few hours. After some ineffectual attempts to improve the ventilation by simple means, it was decided to put in a fan 2·63 ft in diameter, and run it by power transmitted by electricity. An 8-horse portable engine was put up above ground, and with it a Gramme dynamo-electric machine was run at a speed of 1200 revolutions per minute. The electric current thus generated was conducted by a cable, consisting of seven 0.04 in. copper wires, to a second Gramme machine coupled directly with the fan, and placed in the heading near the shaft. Running at 700 to 800, it required 2½ horse power, the useful effect being about 60 per cent The temperature at the face was only lowered 5 deg., but the men could work in eight hours shifts.





The Cotton Industry in Canada.

The rapid developement of the cotton industry in Canada is beginning to be regarded with some uneasiness by many of the cotton manufacturers of the United States, who only a short time ago found a profitable market in the Dominion for the manufactured goods. In 1879, when the present tariff was adopted, there were seven cotton mills in operation in Canada. To this number four new mills have been added and are in operation, while there are nine more in the course of erection. In 1878 the total importation of raw cotton was 7,243,413 lb. In the year ending the 30th of June last 16,018,721 lb were imported The general trade of the Dominion appears to be in a flourishing condition. The total imports, according to a statement just published, have increased from 93,681,787 dols. in 1878. to 105,330,540 dols. in 1881, or an increase of 13 per cent. Exports have increased from 79,323,667 dols. in 1878, to 98,290,823 dols. in 1881, an increase in the aggregate trade of the Dominion of 18 per cent. The imports from Great Britain have increased under the present tariff 16 4·10 per cent., while those from the United States have decreased 24 4·5 per cent.

Smoke Abatement Exhibition.

The International Exhibition, promoted by the National Health and the Kyrle Societies, of grates, furnaces. and other appliances for the scientific consumption of smoke, was opened by the Lord Mayor on the 30th ult. Before the opening of the Exhibition, a meeting was held in the Albert Hall. Amongst those present were Her Royal Highness the Princess Louise, and the Marquis of Lorne.

Mr. Ernest Hart read the report of the Committee, which gave an account of the circumstances which had led to the Exhibition, and of the manner in which the work had been supported by public opinion and by the evidence of scientific men. The appliances are most extensive in their character, and promise to pave the way to some practical good. The Exhibition fills the two arcades leading from the conservatory of the Royal Horticultural Society, and is divided into six sections. Section A. is devoted to "appliances for domestic use, and includes coal fire-grates, stoves of all kinds, kitcheners, &c." Section B. to "gas fires, open grates and stoves, gas producers, and gas heating apparatus of all descriptions for domestic use." Section C. "comprises appliances for heating rooms and buildings. for hot air, hot water and steam circulation." Section D. includes "gas-engines, boiler furnaces, varieties of fire-bars, mechanical stokers, smoke-preventing bridges, and other appliances for steam-engine and general industrial purposes." Section E. "smokeless coals, patent and other fuels." Section F. includes "all foreign exhibits, improvements in chimney flues, ventilating apparatus, and novel inventions for regulating temperature, producing and radiating heat, and abatement of smoke and other noxious vapors." The sections, which embrace apparatus for domestic use, are very attractive and varied, and show that encouraging results must have attended the labours of those minds working towards the same purpose in different ways. We need scarcely say that Section D. will be found extremely interesting to our readers. Amongst the exhibitors in this section are the following well known firms :—The Chadderton Iron Works Company (Limited), Manchester, which shows McDougall's Patent Mechanical Stoker. Mr T. Andrews, Manchester—Furnace Feeders. The Cowburn Safety Valve Company (Limited)—Safety valves. Crossley Bros. (Limited)—Two-horse power "Otto" Gas Engines. Duncan Bros., London—Fuel Economisers. James Farrar and Company, Barnsley—Smokeless Furnaces. George Haller and Company, London—Patent Fire Bars. Lewis and Lewis, London—Newly-Invented Gas Engine for small powers. Livet's Patent Boiler and Furnace Company, London—A number of exhibits, including Boilers, Flues, Furnaces, &c W. A. Martin and Company, London—Smoke-preventing Doors and Furnace Grates. Waller and Company, London—Patent Mechanical Stoker. John Collinge, Oldham—Blocksage's Patent Smoke Consumer and Fuel Economiser. James Proctor, Burnley—Patent Mechanical Stoker and Moveable Fire Bars. Knowles and Halstead, Bradford—Patent Helix Furnace Feeder. G. Hunter and Company. Leeds—Apparatus for Consuming Smoke. Messrs. Thomson, Sterne and Company, of Glasgow, exhibit their Silent Gas Engine, which is attracting much notice.

Blocksage's Patent Smoke Burner and Fuel Economiser, exhibited by Mr. John Collinge, of Oldham, is applicable to all kinds of steam boilers. It consists merely of an inclined oven of the length and breadth of the ordinary grate bars, placed in front of the boiler, and fired by hand in the usual way. The top and sides of this oven are lined with fire-clay blocks, which acquire such an intense heat that the smoke, which is made to impringe against these blocks by the sloping grate bars, immediately ignites the gases, thereby producing perfect combustion before they enter or come in contact with the heating surface of the boiler. By these means not only is all smoke prevented escaping into the boiler flues, but it is turned into useful gases for generating steam, therefore leaving little or no deposit of soot on the surface of the boilers, which so much retards the absorption of the heat by reason of the non-conducting properties of all soot. By an ingenious arrangement of rack and pinion, the grate bars are made moveable by being placed in a frame, which works on a pivot, and gives great facility for removing all clinker and dirt, both from the bars and from the entrance to the boiler flue. Not only are the main grate bars moveable on a pivot, but by means of a knife blade joint and a hand lever the short range of bars projecting into the boiler flue are also separately movable, which enables the attendant more readily to clean out the back portion of the furnace, thereby giving free admission of air and oxygen, which are absolutely necessary for the perfect combustion and the absence of smoke. Underneath the furnace door, and just above the grate bars, by lowering the grate bars, say one tooth of the rack, a small air space is formed which serves the purpose both of admitting oxygen, examining the state of the fires, and of stoking without opening the furnace door, thereby preventing a great waste of heat.

Proctor's Mechanical Stoker is exhibited by the patentee, Mr. James Proctor, of Burnley. The applianee is well known, having stood the test for many years.

This Stoker consists of a lantern wheel, compression spring, and shovel—the novel arrangement of the spring adopted answers the double purpose of both buffer and shovel spring, thereby dispensing with a spring and fittings belonging to the same. Also, by fixing the spring direct to the shovel, a considerable less force is required to throw the coal; and, by placing the bowls of the lantern wheel at variable distances from the centre, it covers the fires uniformly from back to front. Another novelty in this invention consists in the arrangement of the ram and ram box, which entirely dispenses with the rollers for crushing, and gearing belonging to same; and also dispensing with the division in the ram box, using an open one, thus enabling a larger piece of coal to be conveyed to the shovel box—which also is an open one.—this being effected by using a peculiar shaped ram, which pushes the coal alternately to each fire, and which is made to work upon the bottom of the box, and cannot possibly fasten when using wet coal. The wheel having three different lifts or throws, varies the tension upon the spring, the largest lift giving the most tension throws the coal to the back, the next to the middle, and the last to the front of the fire, thereby ensuring an uniform covering and regular supply of coal to the fire. It is here that special features of this Stoker present themselves (viz.) in originality, adaptability, and positiveness of its action: for after the shovel has received its charge of coal, it will throw it where it is desired with greater accuracy than can be done by hand, and it will be seen by a comformation of wheel and shovel, it can be adapted to any kind of furnace, the wheel being made larger, and the shovel broader, as the furnace increases in length and breadth. By the use of the ram as a feeder, the supply of coal can be regulated with the greatest nicety; it can, we are informed, be varied to supply coal from 50 to 400 indicated horse power per boiler. By this method of feeding, whether the coal be wet or dry, or small or otherwise, the fuel is always regular in its delivery to the shovel, thereby keeping a constant delivery of coal to the fire, and preventing the bars from getting bare. Another important advantage is attained by this method of supplying the coal, in only having one hopper for two fires or one boiler, whereas other stokers have two hoppers to one boiler, or one to each fire. The speed of the Stoker, as well as the supply of coal, can be regulated in proportion to the work to be done, As a striking proof of the little power it takes to drive this Stoker, a ⅝-in. hand will drive three of them with all the necessary gear attached, and where driving power is difficult to arrange, this is greatly facilitated by being driven with a band, the band being worked upon a loose and fast pulley, so that it can be stopped or started at pleasure.

G. Hunter and Co., Leeds, exhibit a patent apparatus for Smoke Consuming in Cornish, Marine and other Boilers, consisting of air-box placed behind the bridge communicating with hollow perforated fire-brick arch, whereby air at a high temperature, both from below the smoke and from above it, is injected, thereby effectually exploding the gases and consuming the combustibles. In our next number we hope to notice other exhibits. An important part of the programme of the Exhibition is the trials of the appliances both for domestic an industrial purposes, with reference to "heating power, cost, combustion of fuel, and prevention of smoke." The Committee trust that the opportunity afforded by this Exhibition of various appliances in action, and of improved fuels, and the trials carried on, will result in the extensive adoption by householders and manufacturers of the most successful and useful of the improvements shown, and that the impetus thus given to industrial energy and scientific ingenuity will bring about yet further improvements in the art and practice of heating, without unnecessary production of smoke. The Committe hope, also, that the Exhibition will prove of advantage to the exhibitors, who have incurred considerable labour and expense in bringing their exhibits before the public in the way recommended by the Committee. It is proposed to award certain prizes and medals to the best exhibitors. Among the doners for this purpose is Dr. Siemens, who has offered a prize of 100 guineas. A ladies' prize of 100 guineas, divided into two sums, for the best domestic open grate and best kitchener, will be given. The Council of the Society of Arts have offered a medal; the Manchester Association for Controlling the Escape of Noxious Vapours have added a prize of £50; and further prizes will also be offered.

Siemens's electrical tramway has been a great success so far as public interest is concerned. But as a practical and economical application of electricity, it is very little in advance of what had been done long ago The public see the large car traversing its quarter of a mile at a great speed, and they are inclined to say, "What a wonderful power electricity is; in a short time horses will not be required." But these same people are not aware that it is driven by a 25-horse power steam engine, and that the result is obtained at a great expenditure of fuel. There are special cases, however, where the advantages of such a means of propulsion would be enormous, and Messrs. Siemens deserve the highest credit for the enterprise which has led them to develop the system so far, and there can be little doubt that they will improve it as time goes on and as more advances are made in practical electricity.

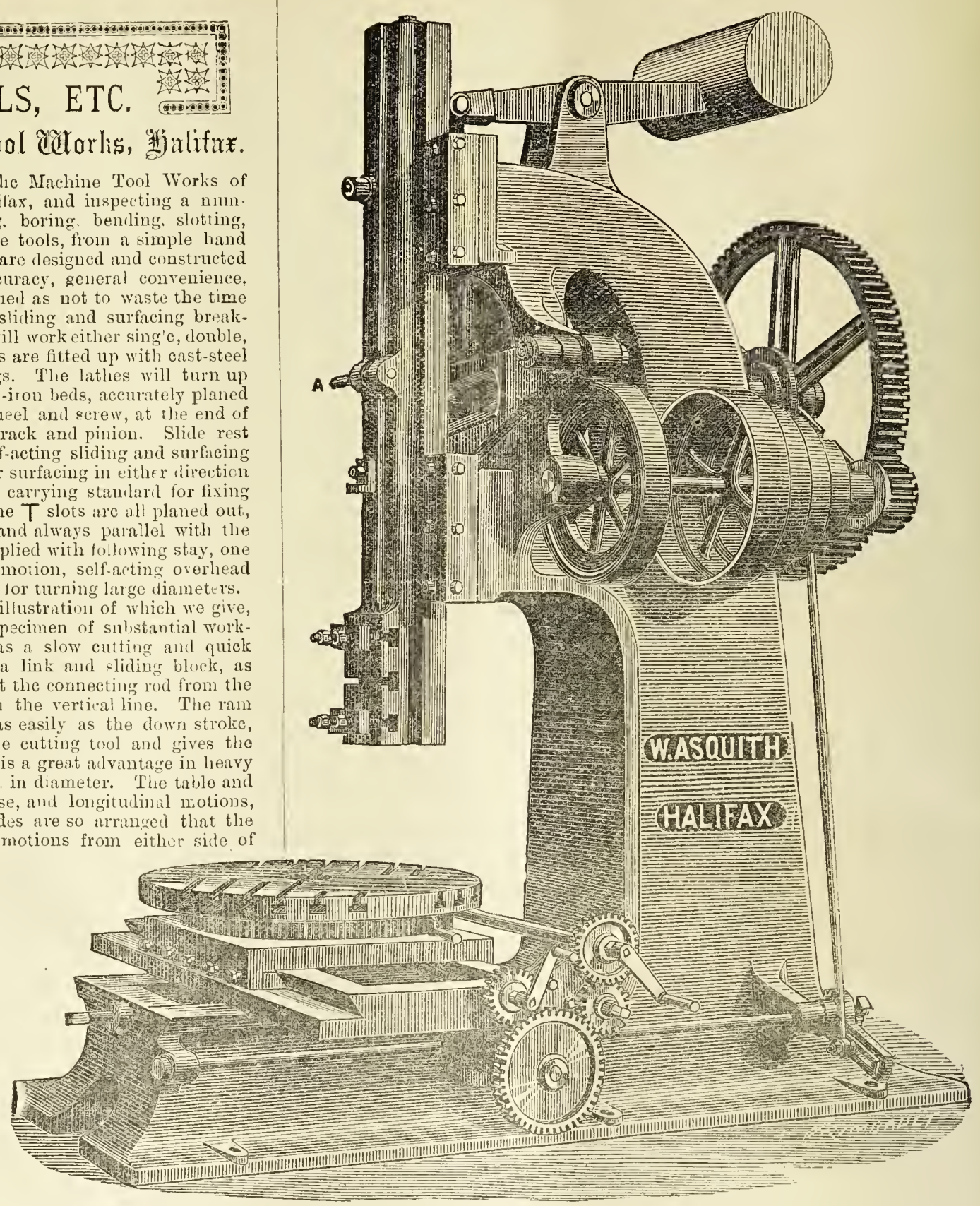
MACHINERY, TOOLS, ETC.

Mr. Wm. Asquith's Machine Tool Works, Halifax.

We recently had the pleasure of visiting the Machine Tool Works of Mr. William Asquith, at Highroad Well, Halifax, and inspecting a number of lathes of various descriptions drilling, boring, bending, slotting, shaping, and other machines. The whole of the tools, from a simple hand lathe to a planing machine—weighing 30 tons—are designed and constructed with the greatest regard to durability and accuracy, general convenience, easy access to the various parts, and so combined as not to waste the time of the attendant. A treble-geared, self acting sliding and surfacing break-lathe deserves special mention. These lathes will work either single, double, or treble geared. The fast heads of these lathes are fitted up with cast-steel spindles, working in gun metal parallel bearings. The lathes will turn up to the diameter stated effectually. Strong cast-iron beds, accurately planed and surfaced, to move in and out by ratchet, wheel and screw, at the end of bed. Carriage on bed to move by hand, by rack and pinion. Slide rest upon the same, adapted for turning conical, self-acting sliding and surfacing by back shaft. Reversing motion for sliding or surfacing in either direction instantly; with strong bed plate in front for carrying standard for fixing slide-rest upon for turning large diameters. The T slots are all planed out, the standard can be moved in any direction, and always parallel with the work being operated upon. Each lathe is supplied with following stay, one small and one large face-plates, top driving motion, self-acting overhead motion, and ratchet lever for working slide-rest for turning large diameters.

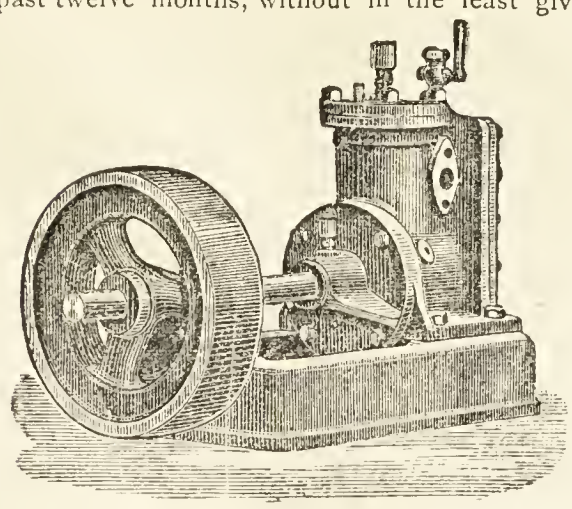
An improved self-acting slotting machine, illustration of which we give, also deserves the highest commendation as a specimen of substantial workmanship. The ram has 20 in. stroke, and has a slow cutting and quick return motion, these motions being given by a link and sliding block, as shown, and the parts being so proportioned that the connecting rod from the link to the ram is never more than 5 deg. from the vertical line. The ram is balanced so that the return stroke is made as easily as the down stroke, which greatly facilitates the adjustment of the cutting tool and gives the workman entire control over the same, which is a great advantage in heavy machines. The machine will take in work 6 ft. in diameter. The table and cross slides are self-acting in circular, transverse, and longitudinal motions, and have a variable feed. The table and slides are so arranged that the workman can control either or all of the motions from either side of the machine, thus facilitating the adjustment of work. The ram is adjustable by a worm-wheel and screw at the centre and of the ram A, and in designing the machine great care has been taken to secure the handiness which is so essential to prevent loss of time in the working of tools generally. The weight of the machine we illustrate is 11 tons. and it is altogether of a very neat and substantial pattern.

Mr. Asquith has lately issued a new edition of an elaborately illustrated catalogue of his manufactures giving the fullest information; which we are sure he will forward to users and purchasers of tools, and at the same time afford them an opprtunity of inspecting his works.



Pratt's Patent Velomotor.

Pratt's Patent "Velomotor"—a unique steam-engine patented in August of last year,—has been brought under our notice by Mr. Alfred Yates, engineer, Blackwall Works, Halifax, who has secured the sole right of manufacture. We, last month, inspected an engine described as of 3 nominal horse power, having a 5 in. cylinder, and 4½ in stroke, which at the time was driving a plaining machine weighing two tons, two heavy lathes (10 in. centres), two drilling machines (one a 36 in. double geared), a grindstone, and about thirty feet of shafting. The whole of the machinery seemed to be driven with the greatest ease. The engine has now been working for the past twelve months, without in the least giving signs of any breakdown.



It was a matter of astonishment to us that a motor of such Liliputian dimensions should be capable of going through such an amount of work. The Patentee has studied three important principles in the designing of the Velomotor—economy in the first cost; economy in space occupied; and economy in the advantageous use of steam. These principles are most certainly attained, as the price is undoubtedly less than any other well-finished engine in the market. It occupies a smaller space than the majority of motors (this being an important principle to exporters), and requires much less steam. We have personal knowledge of the fact that Mr. Yates has removed two ordinary 4 in. cylinder engines, the boilers being too small in size to supply steam sufficient to work them, and replaced them by two 5 in. cylinder "Velomotors," which are supplied with steam from the same boilers; the new arrangement giving entire satisfaction.

Referring to our illustration, it will be seen that the cylinder is placed vertically, and is cast in one piece; the piston has a downward movement, with steam on theupper side only (hence its economy), the casting having a swelled chamber at its base, in which the steel crank—which is balanced—revolves, the crank shaft running in bearings bushed with phosphor bronze. The piston is made deeper than is generally the case, as the connecting rod, being coupled to it, it has to act as cross-head also, the sides of the cylinder acting as guides. The steam-chest is cast with the cylinder. The valve is the ordinary flat slide, but for single ports only, the feed port being at the top of the valve chest; the passage is short and nearly straight, the action being direct. The valve is set to cut off at one half of the stroke, and to close the exhaust early. By this very important action silence in working is ensured, even at a speed which in other engines would be fatal. The working parts of the motor being within the cylinder, and the steam being on the top of the piston only, there are no stuffing boxes required, hence the engine will run continuously without attention, beyond lubrication; and owing to the great speed they work at (and this silently), there is no necessity for a great number of counter shaft-straps, pulleys, wheels, &c., to get speed up. In most cases the machinery can be driven direct, the engine in many cases being less in price than the necessary gearing and connections of other methods. The motors are guaranteed to be of first-class workmanship, and the materials of the finest quality, the shafts being of steel and the bearings of phosphor bronze. They are also guaranteed to drive machinery equal to any ordinary engine of the same size, with less expenditure of steam. The space occupied by a 3 h. p. motor is only 3 ft. 6 in. by 1 ft. 8 in. In sizes above 5 h. p. they are constructed with two or more cylinders, which of course makes a still more superior engine, and ensures very steady driving powers.

The New Adjustable Reed Space Loom.

This invention consists of an arrangement whereby the shuttle box on one or both ends of the slay is made to slide; the fingre which is in connection with the knocking off motion being adjustable, and made to slide to its proper place with the shuttle box or boxes. The alteration from one width of reed space to another is performed in a moment. The advantages of this adjustable slay are great. Many comparatively new looms are often to be changed for others with the reed space suitable to meet a change in demand for cloths of a different width. A manufacturer, having looms with 44 in. reed space, can, with this new arrangement, change to any width down to 36 in. reed space, in which he can make cloth 32 in. wide; a great saving being thereby effected; for if these cloths are woven in a loom with a reed space of 44 in., there is a loss to the manufacturer in driving power, the shuttle having to be sent over more length than is really required, and over eight in. of waste space. The selvages of the cloth cannot be made so good. There are also more breakages of weft, there being more tension on the weft, a longer length being required to be unravelled from the cop to reach from the edge of the cloth into the shuttle box. Manufacturers will undoubtedly effect a saving in wages by the use of the arrangement, especially those in the Lancashire trade, where unfilled reed space has to be paid for; as much as 2d per cut difference being paid between weaving a 32 in printer in a 43 in. reed space loom and in a 36 in. reed space, 2¼ cuts being produced from one loom per week. At places where the patent has been applied the looms have produced many yards of cloth more per week with the same driving pulleys.

The Adjustable Reed Space Loom is made by the patentee, Mr. F. S. Witham, Nelson, Burnley, in other ways than the one described above, but this being generally approved of, and one which is readily and at a small cost applied to looms now running, we only describe this application.

ODDS AND ENDS.

England imports about £45,000,000 worth of manufactured goods from abroad; she exports nearly £222,000,000 worth.

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An international exhibition will be opened at Christchurch, New Zealand, on March 18th next. A special section will be devoted to the exhibits from Great Britain. Gold, silver, and bronze medals are to be awarded.

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America sends to the United Kingdom less than £3,000,000 worth of manufactured goods. The United Kingdom sends to America between £30,000,000 and £40,000,000 worth.

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The annual consumption of cotton in Great Britain may be stated at 1,250,000,000 lbs. About one-fifth is worked up into goods for home consumption; the remainder is converted into goods for export.

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Official reports of the American crops this year are not favourable. The yield of cotton will be considerably less than last year—the decrease varying in some of the States from 30 to 60 per cent. The yield of wheat is estimated at some three bushels an acre less than last year, or a diminution of about 100,000,000 bushels in all.

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The French railway companies have agreed to issue circular tickets for the use of commercial travellers; they are, however, to be circumscribed to a radius of about seventy miles from Paris. Each ticket will allow the bearer to transport a hundred weight of luggage free of charge.

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An association has been incorporated by Act of Parliament, 1881, under the title of The Manufacturers' and Mill Owners' Mutual Aid Association, for the purpose of facilitating, as far as manufactories are concerned, the objects proposed by the Act of 1876, for preventing the pollution of rivers, and also for the utilization of waste products. The secretary (*pro. tem.*) is Mr. J. Breeze, and the office is at No. 5, The Sanctuary, Westminster, S.W.

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It is estimated that there are 240,000 commercial travellers in the United States. Each is supposed to go over his route five times a year, and to carry during that time a ton of baggage. This baggage being generally bulky, it would require 24,000 ten ton cars to transport the trunks and outfits of these mobilised gentlemen. The commercial traveller is, therefore, a factor in the transportation problem as well as the strictly commercial transactions of the country.

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The enterprise of Messrs. Joubert and Twopeny in connection with the Adelaide Exhibition, has been marked by success such as rarely attends undertakings started against such odds as they had to encounter, and in the face of difficulties raised by the very people who were among the first to benefit by the cleverly carried out scheme. The attendances during the closing week gradually increased until they reached a remarkable average. The visitors' list since the opening has been 276,092, and as the population of the colony is about 289,000, the promotors have had visitors in number within 13,000 of the total population. The averags attendance daily has been nearly 5,000.

With reference to the establishment of Chinese merchants in London, we are informed that the Meifoo, by which they are passengers, which reached Suez on the 13th ult., is consigned here to Messrs. Thorne and Co., and that her loading for the return voyage has been entrusted to the same firm. She is bringing a cargo of tea and straw braid from Shanghai and Foochow consigned to various London houses. On her arrival she will load with all possible despatch for Shanghai, calling at the usual intermediate ports.

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The Marquis of Hartington, in replying to a deputation on the subject of the Indian duties on cotton goods, said that if the Government continued to retain those duties, it was not because they attached any value to them from their protective nature, but simply on account of consideration of revenue. Lord Hartington, though he intimated that the matter would be considered by the Indian Government in the preparation of the approaching budget, declined to commit himself to the announcement of any conclusion the Government might have arrived at.

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From New York we learn that immigration continues heavy, and the superintendent of the employment bureau at the immigration office fears there may be considerable privation among the immigrants this winter owing to the inability to find employment for them The demand for labour has fallen off materially lately, on account of the close of the farming season. large numbers of immigrants are now awaiting work, and it is becoming difficult to find employment for any except skilled labourers. A scarcity of labour is reported in the western mining districts, and some will be sent there.

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At the Mechanics' Fair at Boston, U.S.A., Messrs J. Bumstead and Co. show some excellent specimens of carpets and parquetrie manufactured from wood. The carpets are made from strips of thoroughly seasoned wood, in thickness about one-fourth of an inch, cemented on to heavy muslin. They roll up like an oil-cloth, and can be used as a substitute for the ordinary carpet, oil-cloth, or matting in rooms of all kinds. They are admirably adapted for the bordering of Turkish rugs. A section of parquet flooring, and also some samples of borderings, are shown, their effect being remarkably good.

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The produce of cotton per acre in India is not one-fifth of that in Egypt and America, and the quality brings but half the price. An acre of cotton land in Egypt, well watered, yields 400 lbs. of cotton, worth £14 an acre; in India the average yield is 70 lbs, and the value to the grower not more than 20s. The main distinction between the two modes of management is that in Egypt the cotton crop is treated as a wet crop at all stages of its growth, while in India, where the climate is hotter, it is never irrigated.

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The annual report of the Commissioners of Prisons show the development of convict labour. Articles are made of cotton, woollen, linen, and jute; bed-rugs, blankets, woollen cloths, sheetings, shirtings, and dowlas, for use in gaols, are now made in them, and blankets and flannels are shortly to be produced. not only for "home consumption," but for public departments also. At one prison uniforms are cut out and distributed to others to be made up. Oakum-picking is neither profitable nor pleasant to the pickers, so that attempts are being made to supersede it by sack and ship-render making, hemp opening, and cotton, hair, and wool packing.

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The Canadian trade statistics for the year ending June 30th show an increase of English imports of over 16 per cent. and a decrease of American imports of over 24 per cent. When the present tariff was adopted there were seven cotton mills; four have already been added. and nine are building. In 1878 the raw cotton imports were 7,243,413lbs., and in 1881 they were 16,018,721lbs., the total value of the imports in 1878 being $93,681,787, and this year not less than $105,330,840. The exports extending over the same years increased from $79.323,667 to $98,290,823 in each of the years mentioned, ended respectively June 30th.

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The position of guarantor to an exhibition fund is often regarded as a nominal responsibility. The worthy burgesses of Frankürt-on-Main connected with the guarantee fund of the Patent Exhibition, will have, however, acquired a little experience of a nature likely to damp their ardour in the future in that direction. The average daily attendance scarcely reached three-fourths of the estimated number. Passing over the details of the separate items, we may state that the total deficit is nearly half a million marks (£25,000), according to the reports before us. To cover this sum it is calculated that the guarantors will be called upon for the entire sum secured in each case.

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The Postmaster-General has issued a notification to the public with regard to the transmission of newspapers to foreign parts. The regulations affecting such transmission, it seems are frequently disregarded, so that very many newspapers cannot be forwarded to their addresses, and as only comparatively few can be returned to the senders, the general result is not only that addresses fail to receive the newspapers intended for them, but that the senders in this country do not become aware of their detention. The commonest infringement of the rules is insufficient prepayments of postage, but beyond this it is found that a large proportion of the detained newspapers have writing in them, or forbidden enclosures. The public are advised, in order to prevent diappointment to themselves, to comply with the rules of the newspaper post, which may be ascertained from the "Post Office Guide."

The Pyrenean tunnel scheme adopted by the Spanish Chamber allows six years for the work, and fixes the State subsidy at 60,000 francs per kilomètre. As the law is passed, the government will negotiate with France for constructing the tunnel at their joint expense. The French War Office, however, has to consider the scheme before any step is taken.

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The new scheme for cotton mills in China is said to be again in abeyance. The difficulty in the working of China cotton lies in the extreme shortness of the staple, which has given rise to a fear that it may be necessary to mix it with American cotton. A few sample lots have been sent to this country for trial. Should they prove capable of being satisfactorily worked, the machinery will, it is expected, be immediately ordered, and the mills established in Shanghai.

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In the four States of Georgia, Alabama, South Carolina, and Tennessee, the number of persons employed in the manufacture of cotton is 11,788, against 5,890 in 1870. This shows a gratifying increase, but is probably small in comparison with what the next decade will witness, as experience has shown that large profits are attendant upon the manufacture of the Southern staple. A Southern writer, who has made a special study of the subject, estimates that sixty cotton mills in the South have, during the last three years, paid annual dividends of fourteen per cent. each, and that by reason of their proximity to the cotton fields they have an advantage of almost a cent a pound over their Northern competitors in working up the staple.

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One or two donations have lately been made to the Textile Industries Museum of the Yorkshire College, by exhibitors at the late International Exhibition of Wool and Woollen Manufactures, held at the Crystal Palace. Messrs. Willans, Overbury, and Co., wool-brokers, of Copthall Buildings, London, have presented a collection of 157 samples of wool, representing the produce of Great Britain, Ireland, and the principal British wool-growing colonies, as well as the various descriptions of foreign wool most extensively imported into this country. Mr. C. B. Fisher, of Piccadilly, London, has also presented a glass case containing choice samples of prize wool grown in the colony of South Australia, and photographs of South Australian sheep.

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The numbers of workpeople engaged in the several industries in Italy, not comprising those who work at their own houses, such as hand-loom weavers, &c., &c., are, for the silk industry 200,393, of whom three-fifths are women and three-tenths are children; the cotton manufacture employs 54,041, about one-half of whom are women: wool industry gives employment to 24,930, one-half being men: linen and hemp manufacture, 12,784; rope making, 8,400; weaving of mixed frabrics, 5,475; felt hat manufacture, 5,317; tanning, 10,754; sterine candles manufacture, 557; manufacture of seed oils, 1,435; soap making, 2,084; paper making, 17,312; the workshops belonging to railways, 6,403; tobacco manufacture, 15,654, mostly women; the different works belonging to the Government employ 16,612 persons.

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Some experiments have recently been made in Revel, with a view to test the efficiency of a fire extinguishing powder, which, coming into contact with the burning materials, produces heavy fumes which arise in such quantities as to stifle and overwhelm the fire itself. Fire having broken out inside a naphtha and petroleum store, the fire brigade immediately upon their arrival, closed up all openings, stopping up completely the doors and windows. A few boxes of the powder were then thrown into the burning shop, and after the lapse of two hours the doors and windows were opened, copious and heavy fumes issued, by which the progress of the fire had been completely arrested. The results of this experiment have been declared eminently successful. The powder is the invention of an officer in one of the fire brigades at Revel, who is endeavouring to protect it by patent. The powder is expensive, but not so expensive as conflagration.

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Hullamer's recent experiments with compound steam engines, has led him to the conclusion that the difference between engines of one and two cylinders in point of economy is very slight. In ranging from 80 to 8000 horse power, with revolutions varying from 25 to 90 per minute the expenditure of steam for a given amount of work remains the same for the same type of motor, the consumption for two cylinder motors are identical for Woolf and compound, whatever may be the volume of the cylinders, provided the motors are regulated so as to give the maximum efficiency; the expenditures of steam in motors of one, two, and three cylinders, suitably regulated and constructed, are so nearly alike that the choice may be governed in each instance merely by the fitness of the type of the engine for the particular purpose required.

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The Milan exhibition of national industry closed on November 1st., and is said to have been highly successful. On the Sunday before the final closing, 21,000 persons paid for admission. The total number of persons paying for admission during the period the Exhibition remained open, was 1,546,567, the total receipts for ordinary admission and season tickets being £49,074 18s. 6d. At this Exhibition the whole process of the manufacture of silk was shown, from the propagation of the silkworm to the finished article in all colours, thread, ribbon, wide web, flowered silk, artistic design, &c. A large number of workpeople visited the Exhibition, either through their societies, or in direct connection with their respective factories. Every effort was made by the corporations of the larger cities, and the large manufacturers, to enable their workpeople to see and profit by the advance shown in their respective industries. On one occasion there were as many as 860 women and girls from one establishment of silk manufacturers alone, while at another time 4,600 men, women, and girls employed in the cotton and linen industries, came from one district.

Chromate-Tanned Leather.

A few weeks ago we visited the Leather Trades' Exhibition at the Agricultural Hall, Islington. Perhaps the most prominent amongst the exhibits were those of the Eglinton Chemical Company, of Glasgow, who displayed, amongst other articles, some excellent samples of Leather Belting, Hose Pipes, &c., tanned by their Chromate process. Since the above time we have gained much information regarding the Company's process of tanning. It is not our intention to describe the process, but we may state that whilst under the system of Bark Tanning the time occupied in rendering leather fit for use varies from 6 to 18 months; under the Chromate system the whole process is completed in from 14 to 28 days, and it has lately been proved that under the latter system the leather is quite equal to, and in many respects superior to, that of the former. For belting purposes it is strong and durable, and being tough and pliable, it is not liable to crack or slip on the pulley. Samples suitable for beltings, &c., have been tested by gentlemen eminently qualified to judge of the capabilities of the leather, and they have spoken very highly in its favour. An official test has lately been made of the comparative tensile strength of Chromate against Bark-tanned leather belting, the result of which showed the former to be 31 per cent. stronger than the latter. The cost of the Chromate-tanning material is less than 1½d. per lb. of leather produced, against 4d. under the Bark system; and when the saving of time, wages, &c., are taken into consideration, the benefits derived from the purchase of beltings made from this leather must be apparent to all. We have no doubt the Eglinton Chemical Company will be happy to forward samples of leather belting to all those interested in this, the latest process of tanning.

THE GAZETTE.

Adjudications of Bankruptcy.

Keith John, 4, Nelson Square, Great Horton Road, Bradford, merchant.
Johnston John, Edenordinary, near Banbridge, Down, linen manufacturer and merchant.
Evans William Dennett and Hemington Cant, trading as Evans, Cant and Co., Stratford, dye manufacturers.

Liquidations by Arrangement or Composition.

Wilson Arthur, Dale Street, Ossett, near Wakefield, rag merchant, late woollen cloth manufacturer.
Wilson James, jun., Ossett, near Wakefield, book-keeper, late cloth manufacturer.
Hiscock Susan Eliza, trading as A. Hiscock, Wormwood Street, and Linden Villas, Snaresbrook, mat manufacturer and carpet dealer.
Sunderland Wiliam, Battye Mill, Colne Bridge, near Huddersfield, shoddy merchant.
Varley James. Bramley, Leeds, cloth manufacturer.
Taylor Edwin. trading as Edwin Taylor and Co., Albert Mill, Whitefield, Lancashire, cotton manufacturer.
Rothery Allen, Wakefield. worsted spinner.

Sequestrations.

Murray John and Co., Denhead, Ellon. merchants. and John Murray, and James Adam, the partners and as individuals.
Gibb and Co., Govan, near Glasgow, power loom mannfacturers, and John Gibb, sole partner.
Henderson John M'Ewan, sometime Dumfries, manufacturer.

Trustees Appointed.

Butterfield Edward A., and Herbert Butterfield, trading as Butterfield Bros. (Liquidation), Wool Exchange, Coleman Street, Kingsland, and West Hampshire. Trustees, E. T. R. Wilde, 51, Moorgate Street, accountant, and John F. Quartly, 30, Budge Row, accountant.
Brookes David, trading as D. Brookes and Co. (Bankrupt), Leek, Staffordshire, silk manufacturer. Trustees, J. A. Bishop, Leek, accountant, and M. Knowles. Leek, silk manufacturer
Cowburn James (Liquidation), Radcliffe, Lancashire, manufacturer of cotton goods. Trustee, A. H. Lamb, 1, Princess Street, Manchester, accountant.
Kirkham Thomas (Bankrupt), Harpurhey, near Manchester, cotton manufacturer, late Stalybridge, grocer and draper. Trustee, F. J. Astbury, St. James' Square, Manchester. accountant.
Scott Thomas (Bankrupt), Eccleshill, Yorkshire, woolstapler. Trustee, W. M. Gray, Bradford, accountant.

Dividends.

Scarlett Edward G. (Liquidation), Glasshouse Street, Middlesex, late Malden, Surrey, woollen merchant. 2nd dividend, 10d.; Nov. 9, between 11 and 12; Halse, Trustram and Co., 17, Old Burlington Street, solicitors.
Sharp Daniel, William Sharp, and John Sharp, trading as D. Sharp and Sons (Liquidation), Brook Street, Bradford. spinners and stuff manufacturers. 1st and final dividend, 4s 6d; W. Glossop, 33, Kirkgate, Bradford.
Lister George (Liquidation), Keighley and Braford. stuff and Angola mannfacturer. Dividend, 4s. 3d., consisting of 1s. in the £ for cash, 2s. 3d. in bills due January 10, 1882, and 1s in bills due April 10, 1882; B. Musgrave, Victoria Chambers, Bank Street, Bradford, accountant.
Fretwell John (Liquidation), Hanson Lane, Halifax, late Barnsley, dyer. 1st dividend, 10s.; on and after December 12; J. Wood, 1, Waterhouse Street, Halifax.
Clough Frank (Liquidation), Wibsey, Bradford, worsted manufacturer (separate estate). 1st and final dividend, 2s. 10d.; on and after December 1; B. Musgrave, Bank Street, Bradford, accountant.

Bills of Sale.

Brewer Edwin, 37, Chapman Road. Small Heath, Birmingham, laco warehouseman, for £70, to Arthur T. Carr.
Kingsland John. 126, Ledbury Road, Bayswater, costume manufacturer, for £159 7s. 6d., to L. and W Loan Co.
Lyle David Fraser, 90, Sheuley Road, Camberwell, carpet manufacturer's agent, for £26, to William Hollingsworth.
Bowden Joseph, Coombs Mill, Chapel-en-le-Frith, Derbyshire, manufacturer of cords, for £30, to Northern Investment Co.
Lees Robert. Hartshead, Yorkshire, late cotton spinner, for £150, to William F. Singleton.
McDougall Thomas, 27, Bridge Street, Burnley, dyer, for £20, to Burnley Loan Co.
Scrivener William, West Ham., Stratford, lace manufacturer, for £14, to Benjamin Blaiberg.
Haigh Fred, Smithy Bridge, Rochdale, rug maker, for £13, to Maurice Cohen.
Hargreaves Thomas, Wellington Street, Todmorden, for £60, to James Fielden.
Ingham Richard, Sowerby Bridge, Halifax, cloth finisher, for £50, to John Ainley.
Spencer James, 1. Peel Street, Heywood, cotton waste dealer, for £120, to Albion Loan Co,
White George B., 78, Sussex Road, Holloway, woollen warehouseman, for £15, to National Deposit Bank.
Fowden William, 16, 18, and 20, Miller Street, Broughton, Salford, shirt manufacturer, for £30, to James F. Townend.
Topping Thomas, Clarke's Croft, Topping Fold, Bury, woollen merchant, for £59, to Isaac Fineberg.

Dissolution of Partnerships.

Gow Cooper and Company, Alva, manufacturers. Debts by George Gow.
Minto and M'Auley, Alva, dyers. Debts by J. D. Minto, who continues the business as the Braehead Dyeing Company.
Lottimer, Jack and Co., Queen Street Glasgow, mantle manufacturers. Debts by W. Lottimer.
Anderson William and Sons, Newburgh, manufacturers. The business continued by George Anderson.
Roy William, now or recently Hope Street, Glasgow, merchant. Moore and Brown, Hope Street, Glasgow; elect com. in room of J. R. Napier, resigned.
Pickles and Company, Salterhebble, near Halifax, cotton waste breakers. Debts by William Pickles.
Smith and Scott, Walker Street, Rochdale, warp sizers. Debts by William H. Scott.
Tolson and Fox, Dewsbury, wool merchants. Debts by Thomas Bateman Fox.
Tullidge, Peters, and Bridges, Paternoster Square and Langdale Road, Peckham, wool, rug, and mat manufacturers. As regards Joseph Tullidge.
Hargreaves and Mitchell, Vale Mill, Todmorden, Yorkshire, cotton manufacturers. Debts by James Edward Mitchell.
Turner A. and E., Dapper Mills, Wheatley, near Halifax, cloth finishers and fullers.
Armitage and Russum. Park Place, Leeds, and Cliff Mills, Pudsey, cloth manufacturers.
Coates and Hepper, Aire Street, Leeds, woollen merchants.
Dixon Henry J. and Sons, Aldermanbury, London, and Kidderminster, carpet manufacturers.
Everatt and Hook, Tib Street, Manchester, mantle manufacturers and merchants. Debts by George Everatt.
Jackson and Kershaw, Ashbrook Mill, near Rochdale, cotton manufacturers.
Hoyle and Crapper, Bacup, Lancashire, cotton spinners and manufacturers.
Lancashire T. J. and Company, Ashton-under-Lyne, cotton spinners.
Waddington and Woodhead, Copley, Halifax, worsted spinners.
Tetlaw, Sutcliffe and Company, Elland, Halifax, woollen manufacturers and finishers. As regards John Tetlaw.
Wynne and Weir, Linen Hall Street, Belfast, linen and commission merchants.

PATENTS.

Applications for Letters Patent.

4732. James Kershaw, Macclesfield, "Improvements in the manufacture of merino, linen, cotton, and other textile fabrics woven in broad looms."
4734. Peter Crook Marsden and William Pendlebury, Bolton "Improvements in the construction of apparatus employed for combing cotton and other fibrous substances."
4746. Aspden Pickup Dickinson, machine maker, and Joseph Crook, power loom overlooker, Blackburn, "Improvements in looms for weaving."
4805. John Murgatroyd, James Croad, and Samuel Murgatroyd, Luddenden, "Improvements in flyers for spinning, drawing, and twisting wool and other fibres."
4834. Thomas Singleton, Darwen, machinist, "Improvements in looms for weaving."
4846. Orange M'Connell Chamberlain, Gresham House, Faraday Road, Notting Hill, Middlesex, "Improvements in pleating and frilling machines."
4847. George Little, of Oldham, in the county of Lancaster, mechanical engineer, "Improvements in machinery employed in 'preparing' wool, cotton and other fibres."
4899. John Imray, 28, Southampton Buildings, Middlesex, "Improvements in the manufacture of colouring matters."—A communication.
4908. John Stewart Smith and Samuel Smith, both of Glasgow, manufacturers, "Improvements in the weaving or manufacture of Kidderminster, Scotch, or Ingrain carpets and other similar two or three ply fabrics."
4911. William Thomas Cheetham, patent agent, 18 Saint Ann's Street, Manchester, "Improvements applicable to carding engines for carding cotton, wool, and other fibrous materials."—A communication.
4944. William Blackburn, Clarence Mills, Cleckheaton, worsted spinner, "Improvements in the manufacture of mixture yarns."
4960. Charles Denton Abel, 28, Southampton Buildings, Chancery Lane, Middlesex, "An improved method of and apparatus for cleaning carpets and other textile fabrics."—A communication.
4984. James Joseph Delmar, Ormside Street, Old Kent Road, Surrey, "Improvements in the mode of manufacturing carpets and other similar looped, piled, or corded fabrics."
5013. Joseph Thompson, Blackburn, "Improvements in looms for weaving."
5031. Matthew Dickie, of Stockport, "Improvements in the construction of apparatus employed in spinning and doubling cotton and other fibrous substances."
5059. Edmund Edwards, of the firm of Edwards and Co., patent agents and engineers, 40, Southampton Buildings, Chancery Lane, Midlesex, "Improvements in machinery or apparatus for carding and spinning cotton or other fibre."—A communication.
5068.—John Lawrance Stewart, Bradford, manufacturer, "Improvements in looms for weaving."

5089. Albert Smith Bradford, spinner. and Michael Firth, the same place, combing overlooker, "Improvements in machinery for combing wool, cotton, silk, flax. and other fibrous substances."
5114. Abraham Place, Macclesfield, "Improvements in jacquard machines."
5115. Richard Scott Collinge, Edward Collinge, and Robert Collinge. Oldham, "Improvements in looms for weaving."
5132. William Robert Lake, of the firm of Haseltine, Lake, and Co., patent agents, Southampton Buildings, London, "Improvements in and relating to temples for weavers' looms."—A communication.
5134. William Thomas Emmott, Manchester, "Improvements in apparatus for spinning wool and other fabrics."—A communication.
5135. Frederick Ripley, worsted spinner and manufacturer, and Thomas Hargreaves Brigg, machine maker, Bradford, "Improvements in spinning machinery."
5155. Thomas Henry Cobley, Dunstable, "Improvements in the manufacture of mineral white substances suitable for dressing and facing paper and fabrics."
5161. William Raven, Leicester, hosiery manufacturer, "Improvements in the manufacture of ribbed hose and socks."
5167. Henry Adrien Bonneville, British and Foreign Patent Offices, 8, Rue de la Chaussée d'Antin, Paris, France, and 90, Cannon Street, London, patent agent, "A new or improved means of manufacturing woollen fabrics."—A communication.
5170. Robert Andrews, Bessbrook, Ireland, flax preparing master, "Improvements in drawing or preparing frames."
5174. Leeming Webster, Dewsbury, machine maker, "Improvements in machinery employed in washing, scouring, and dyeing fabrics."
5187. Richard Vickers and Robert Vickers, Burnley, "Improvements in looms for weaving."
5188. John Bullough, Accrington, machine maker, "Improvements in looms for weaving."

Grants of Provisional Protection for Six Months.

3791. 3854. 4068. 4072. 4074. 4125. 4164.
4216. 4258. 4272. 4286. 4327. 4334. 4348.
4358. 4432. 4457. 4460. 4464. 4465. 4466.
4482. 4494. 4495. 4499. 4531. 4613. 4711.
4713. 4588. 4710. 4732. 4734. 4746. 4752.
4788. 4805. 4813. 4847.

Notices to Proceed.

2841. 2866. 2890. 2892. 2958. 3018. 3045.
3046. 3066. 3080. 3093. 3176. 3233. 3480.
3709. 3874. 3914. 3918. 3949. 3996. 4072.
4213. 4392. 4671. 4711. 4713. 3220. 4125.
4686. 4733.

Patents on which the Stamp Duty of £50 has been Paid.

4469. Francis William Parker, Wilton Square, Middlesex, pattern book maker, and Frederick William Barber, South Norwood, Surrey, accountant, "An improved mode of packing ribbons and other narrow fabrics for the market."
4556. Thomas Henry Rushton, of the firm of Messrs. Dobson and Barlow, Bolton, machine maker, and James Albinson, of the same place, foreman, "Improvements in frames for gassing yarn."
4908. Herbert John Haddan, of the firm of Herbert and Co, solicitors of patents, 67, Strand, Westminster, civil engineer, "Improvements in mechanism for spinning."—A communication.
4604. Henry Whitaker, Manchester, "Improvements in tubes, being a substitute for the paper tubes used in spinning and doubling frames."
5194. Henry Whitaker, Manchester, "Improvements in and apparatus for spinning extra hard twisted or 'wig' yarn upon the mule."
4726 John Peter Griess, Burton-on-Trent, chemist, "Improvements in obtaining colouring matters suitable for dyeing and printing."
4778. John Stewart Templeton, Glasgow, manufacturer, "Improvements in ornamental pile fabrics."
4856. Engène Adolphe Lheureux, Boulevard, Saint Denis, 1, Paris, manufacturer, "Improvements in fabrics."
4876. William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in machinery for manufacturing weavers' harness."—A communication.

Patents on which the Stamp Duty of £100 has been Paid

4074. John William Lamb, manufacturer, and Samuel Lowe, machinist, Nottingham, "Improvements in knitting machinery."
4002. Philip Goldschmidt, Manchester, and James Chambers, Bury, "Improvements in the construction of self-acting 'temples' used in looms for weaving, and in tools or apparatus employed in such manufacture."

Patents Sealed.

2099. Samuel Cook, senior, Bury, machine maker, and Samuel Cook, junior, of the same place, machine maker, "Improvements in self stopping, warping or beaming machines."
2516. John Brentnall, Sherwood Rise, Mansfield, "New or improved jacquard machine or mechanism for producing in fabrics ornamentation of various kinds, for hosiery and other purposes."
2773. Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in spinning and twisting machinery."—A communication.
3127. Arthur Greenwood, Leeds, machine maker, "Improvements in silk-dressing machinery."—A communication.
3553. Gustav Jagenburg, Rydboholm, Sweden, "Improvements in dyeing aniline black on cotton, unspun. spun. woven, or in other condition."
2266 Edward Crossley and Louis John Crossley, carpet manufacturers, and William Sutcliffe, manager, Halifax, "Improvements in spinning, and in machinery or apparatus connected therewith."
2282. Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in the manufacture of artistic hangings or fabrics in imitation of tapestry work and otherwise, for the decoration of walls, furniture, artic es of dress, and other like purposes."
3590. Charles Alfred Barlow, of the firm of Henry Bernoulli Barlow, Manchester, patent agent, "Improvement in machine embroidery, and in the process and apparatus for manufacturing the same."—A communication.
2195. Jacob Warburton, Bolton, Lancaster, "A new figured cloth, and the method of manufacturing the same."
2247. Albert Webb, Copenhagen Street, Worcester, hair cloth manufacturer, "Improvements in the manufacture of carpets and rugs."
3048. Charles Alfred Barlow, of the firm of Henry Bernoulli Barlow, Manchester, patent agent, "Improvements in circular combing machines for combing cotton, wool, silk, and other fibre."—A communication.
3801. John Chisholm Oldham, machinist. and John Clegg, of the same place, "Improvements in mules for spinning."
2108. William Irlam, of the firm of William Irlam and Company. Eccles, manufacturers, "Improvements in cotton pile plushes, and in the method of and processes used in the manufacture thereof."
2221. John William Bannister, Britannia Mills Leeds, and William Bywater, Sweet Street Foundry, Leeds, "Improvements in means or apparatus for dressing and finishing woollen or worsted fabrics."
2360. William Walker, Radcliffe Bridge. Lancaster, manufacturer, "Improvements in stopping motion for looms."
2228. William Strang, Glasgow, manufacturer, "Improvements in weaving plain and ornamental gauze and analogous fabrics, and in apparatus therefore."
2313. Finlay McCance, Director of the Ulster Spinning Company, Limited, Belfast. "Improvements in the manufacture of woven fabrics suitable for table napkins, table cloths, towels, or other articles which are to be ornamented with embroidery."
2426. Richard Longden Hattersley, Keighley, and David Bailey, Huddersfield, "Improvements in looms for weaving."

Copyright of Designs.

(Registered during November, 1881.)

Class VI., Carpets.

372,483. John Barry Ostlere and Co. (Limited), Kirkcaldy.
373,501. Blackwood Brothers, Kilmarnock.
373,460-61. Woodward, Grosvenor, and Co., Kidderminster.
373,462. Henderson and Co., Durham.
373,3[illegible]3. The Heckmondwike Manufacturing Company (Limited), Heckmondwike.
373,208. The Heckmondwike Manufacturing Company (Limited), Heckmondwike.
373,130-32. The Heckmondwike Manufacturing Company (Limited), Heckmondwike, Yorkshire.
372,916. A. F. Stoddard and Co., Elderslie.
372,803. The Heckmondwike Manufacturing Company (Limited), Heckmondwike.
372,724-26. T. and M. Hutchinson and Co., Bread Street, E.C.
372,847-59. Mitchell Brothers, Albert Works, Waterfoot, Manchester.
372,470-75. Thomas Bond Worth, Severn Valley Mills, Stourport.
372,996. John E. Barton, Kidderminster.

Class XI., Furnitures.

373,354. Daniel Lee and Co., Fountain Street, Manchester.
373,355. Leigh, Appleby, and Co., 57, George Street, Manchester.
373,356-57. Turner, Norris, and Turner, 99, Portland Street, Manchester.
373,690. Thomas Hoyle and Sons (Limited), Manchester.
373,691. John Bennett and Sons, 9A, St. Peter's Square, Manchester.
373,486-87. The Rossendale Printing Company, Manchester.
373,488-90. Daniel Lee and Co., Fountain Street, Manchester.
372,476-77. Daniel Lee and Co., Fountain Street, Manchester.
372 335. Thomas Hoyle and Sons (Limited), Manchester.
372,711-14. H. Ahrens and Co., London and Japan.
372 611. Daniel Lee and Co., Fountain Street, Manchester.
373,209. F Steiner and Co., Church, Accrington.
372,985. Daniel Lee and Co., Fountain Street, Manchester.
373,571. F. W. Grafton and Co., 91, Portland Street, Manchester.
373,155-57. The Rossendale Printing Company, Manchester.
373,469-73. William Rumney and Co., 44, George Street, Manchester.
373,453-54. Daniel Lee and Co., Fountain Street, Manchester.
373,576-85. Daniel Lee and Co., Fountain Street, Manchester.

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The Journal of Fabrics.

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Knap's Mechanical Stoker.
T. and T. Vicar's Mechanical Stoker.
Chubb and Co's. Patent Atmospheric Blast Smoke Consuming and Fuel Saving Apparatus.
Gowthorpe's Apparatus for the Consumption of Smoke and Gases from the Furnaces of Steam Boilers.
Henderson's Patent Fire-door.

Notices.

The Half-Yearly Subscription—payable in advance—including home postage, is 3s. 6d. Cheques and Post Office-Orders to be made payable to H. & R. T Lord, 3, Gerrard Street.

The Publishers will be happy to receive intimations of New Inventions, Patents, &c.

The Publishers are open to receive from Designers, Original Designs of Carpets, Damasks, Tapestries, Linen, Cretonnes, &c., and such as are accepted will be published with the Designers name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

Literary communications must, in all cases, be accompanied by the names and addresses of the writers, not necessarily for publication, but as evidence of authenticity.

Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics* for publication, will be considered as offered *gratuitously* unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers in making enquiries of, or opening accounts with Advertisers in this paper, will kindly mention the *Journal of Fabrics* as the source from whence they obtained their information.

The French Treaty.

Another tangle has arisen in the course of the negotiations in connection with the Anglo-French commercial treaty—this time a fatal one, according to most opinions, although not according to our own. Some days ago the English Press generally announced in positive terms that it was "all up;" since then the French papers have scolded the English journals very severely for their precipitancy, intimating that it seemed very much as if the wish was father to the thought on the part of "perfidous Albion." The net position is, however, simply this:—As far as the politicians can carry the matter the question is at an end. An English semi-official daily crossly remarked the other day that it was all owing to the imprudence of M. Gambetta. The same journal cheerily anticipated, on M. Gambetta's accession to power, that all doubts as to a speedy and satisfactory settlement of the treaty might safely be cast to the winds. All this goes to prove not M. Gambetta's "imprudence," but the uncertainty that pervades M. Gambetta's *régime*, and the utter uncertainty that is ever inseparable from politics in France as in all other countries. Many persons both thought and said that when M. Tirard was "dished" the chief difficulty in the way of the successful negotiations for a treaty was removed. This was not our opinion, for we anticipated that though M. Tirard, on account of his being one of a Ministry that fell so heavily, could not consistently be asked to remain, yet at the same time we felt quite certain that M. Tirard's influence would be most assuredly manifest in the proceedings that followed; and sure enough this has proved to be the case, for M. Tirard has been present at the conclusion and signing of all the treaties between France and the seven other countries who have entered into fresh contracts with her. This unfortunate, but unavoidable, political influence will, it is to be hoped, speedily run its course—as run its course it must and will. The remaining resource is public opinion, and this, although not sufficiently recognised at the outset, as possessing the power, will most undoubtedly prove itself to be more potent, if not more prompt, than the will of political statesmen The way in which this power of public opinion will act is similar to that in which it acted in the cases of Italy, Spain, and Austria in 1878, and which we referred to in our number of November last. The inconveniences to French trade and commerce will lead the opinion of the country both to exert itself, and also to make itself felt. Of course it is undeniable that some inconveniences will be felt by British trade and commerce. What those inconveniences may be it is easy enough to see on referring to the English translation of the New French General Tariff, which was moved for and obtained by Lord Sandon, and which will, in the circumstances that have arisen, possess a value that was never anticipated for it by many persons. Many commercial men say that it will not make much difference to us, as we shall send our goods to France through Belgium, after the eighth of next month Against this delusive view, we here pointedly press upon our readers to be on their guard; especially all who are interested in the textile trades. If the French feel that the Treaty with England is likely to become a thing of the past, they will not be slow to require "Certificates of Origin" on all imports, which would throw all English goods under the operation of the General Tariff at once. But if even France does not take this step, it must be remembered that the recent treaty between France and Belgium incorporated the principle of *specific duties* on all textiles. The determination of M. Tirard to get the Belgium Treaty signed on these lines before he left office, is a tangible proof of his political shrewdness and foresight. To Belgium it did not seem to matter so much, as the Belgians import into France very few textile manufactured goods; and, besides, they reckoned on getting all the advantages which might subsequently be accorded to England, under the "most favoured nation" clause, inserted in the Franco-Belgian Treaty. Indeed, it is on this very fact—that of specific duties being adopted in the Belgian Treaty—that the French statesmen now rest as the fulcrum in their resistance to our demands for *ad valorem* duties.

Thus far as regards some of the inconveniences to British commerce, on which space forbids us to say more at present. That the French will suffer more than we shall is a conclusion that needs no great sagacity to arrive at. They are free to send their merchandise to us all the same, it is true, but they throw themselves under the necessity of importing all their raw materials, at all events, such as they get from England, subject to the increased duties of their own General Tariff, and thus the French public will have to pay more dearly for the manufactured article, at the same time they will have to establish a gigantic system of drawbacks on their exports of those manufactured goods, the raw materials of which have had to pay increased import duties.

For ourselves we enjoin the utmost calmness on the public of this country—no panic, no inconsiderate haste, as these difficulties will all rectify themselves with time and patience. The best evidence of the wisdom of this course is to be found in the experience we have cited, to which we need only add the words of one of the best of French political economists:—"If the negotiations with England fail, we shall be driven to alter the General Tariff in order to save ourselves from ruin."

John Brinton and Company.

This firm which has for many years carried on the business of Carpet Manufacturers and Worsted Spinners at Kidderminster, established in the year 1821 by the late Henry Brinton, and now perhaps the largest Brussels Carpet Manufacturing firm in the world, has been converted into a Limited Liability Company with a capital of £250,000, of which £200,000 is called up. The firm consisted of Messrs. John Brinton, M.P., William Henderson, John Bennie, and John Henry Pearse, and these with Mr. Henry John Chaytor, who has been for some years connected with the firm, are the Directors, and hold 1925 out of the 2000 shares into which the capital of the company is divided. The purchase money for the freeholds, stock and effects of the partnership is £252,601 16s. 10d. which is the net value after paying all liabilities.

Technical Education.

In our last issue we placed before our readers a little of the evidence that had been gleaned by one of the Commissioners appointed by Government to inspect the various technical schools upon the Continent. The result we think must be to make Englishmen determined, that in future no one shall be able to draw such a contrast between ourselves and our neighbours across the channel, as that forced upon us by its perusal. We must set about in earnest to secure not merely for the children now in our schools, but for those who have lately left them, and who will in a few years be the directors and controllers of our manufactures, sounder information than they have hitherto had. Let us see what available opportunities exist at the present time for the acquisition of technical knowledge; and as drawing is at the root of most of this knowledge, we will direct our attention chiefly to that. In our elementary schools drawing is divided into two grades, denominated Grade I. and Grade II. Grade I. comprises—(*a*) Freehand, the requirement being to copy a simple figure in outline either the same size or slightly enlarged; (*b*) Model, requiring the children to be able to represent in outline two simple objects placed before them; (*c*) Geometry, comprising the use of a pair of compasses and ruler, and the construction of some few of the geometrical figures. In Grade II. the Freehand and Model are more difficult; to the syllabus of Geometry is added a little solid Geometry, and a new subject perspective is introduced. The school time of children is so short that but very little real advantage is reaped from the amount taught, and the craze for percentages has often led teachers in some degree to neglect the subject, if not to omit it altogether. In some country districts, in fact, drawing is never taught at all. The teaching staff, too, in the elementary schools has been of such a poor character, that except from the head teacher there was but little chance of a child receiving any sound instruction in the subject Not ten per cent. of the children who leave our elementary schools have passed the examination in the three subjects constituting Grade I., and not two per cent. leave having passed the subjects in Grade II. This applies of course to the public elementary schools of the country; what it is in the middle class schools we have no means of knowing, but we should say the results are more meagre. The number of children in our elementary schools, according to the last Government report, was 3,300,000, and of these little more than half were taught drawing. Then, turning to the schools of art what do we find? According to the last Government return, the following was the attendance at the Schools of Art, in

Leeds	600
Bradford	647
Huddersfield	130
Halifax	61

or a total of 1,438 for the four towns. The only reason we have taken these four towns is that the population is essentially manufacturing, and therefore most likely to reap great benefit from the establishment of technical schools. Yet how small is the enthusiasm and how few the numbers anxious to become acquainted with some of the true principles of art! And even of this number a very large percentage must be put down to teachers in elementary schools. Mechanics' Institutes will gradually cease to fulfil the duties originally fixed for them; education is spreading so rapidly that as elementary educators their occupation will be gone. In all the four towns enumerated we find an excellent supply of Board Schools; why not then make them useful as drawing centres to carry on the work commenced in the day school? Hundreds of boys would be allowed to attend a class near at hand, who would not be allowed to make a long journey to the centre of the town; and workmen, too, would be found to attend in much larger numbers than at present. These centres might be made so many feeders for the central school, where work of a higher class might be carried on. There are many excellent teachers of drawing among our elementary teachers, so that both schools and teachers are at hand; all that is wanted is some able organiser in each town whose heart shall be in his work, and we feel that success will be assured.

Some strong effort must be made, and we put this before our readers as a suggestion. Instead of interfering detrimentally with existing arrangements, we believe that they would be much strengthened; material of a less crude kind would be brought under the teaching of the art master, and their work, shorn of much of its drudgery, would be of greater value.

Second-Hand Machinery.

Ordinarily, he who buys second-hand goods, realizes, when it is too late, he has made a bad investment, but consoles himself in the thought of having obtained a valuable experience, in some cases dearly bought. The purchaser of a second-hand boiler is peculiarly liable to be victimized, and is not only in danger of losing his money, but in most cases runs an additional risk of losing his life It will, of course, be conceded that occasionly great bargains may be obtained in buying second-hand material. Such cases sometimes occur through the bankruptcy of large manufacturing companies, or from other business causes. In cases of this kind it is easy to find out who furnished the plant, the length of time it has been in service, and the manner in which it has been used, with, perhaps, satisfactory assurances of its present condition. Opportunities of this kind are few and far between. Engaged in the business of buying and selling second-hand machinery, are many honorable men, who, understanding their business, are careful to buy only fit and saleable articles, and thus they avoid the necessity for misrepresentation in selling again. The dealer is not alone to blame for the gross misrepresentation sometimes made. The average buyer of second-hand machinery is not content to buy the article for what it really is, and his evident desire to be humbugged stimulates unscrupulous men, who in the trade are largely in the majority, to make a shrewd calculation as to the manner of man with whom they are dealing, and cook up a story most likely to serve their purpose. Many tricks are resorted to by the latter class of dealers to sell their second-hand boilers. It is doubtful if they ever handled anything that had been used over a year, and was not built by days' work, if we may believe their story. In second-hand boilers the accumulation of sediment and scale on some inaccessible part during a period of years, greatly reduces the value of its heating surface. Therefore, such boilers are necessarily more expensive in fuel than new ones. In some locations, where fuel is abundant and cheap, the matter of economy is of little importance. As a rule, boilers are only removed for some sufficient cause affecting their safety or economy, and they will be found on examination, when this is the case, fatally defective in some important particular. It may not be an easy job to make a careful examination of a boiler after it has been scraped and heavily painted. The most careful, painstaking examination under such circumstances may be very unsatisfactory in failing to detect incipient fractures in the sheets, the first external evidences of crystalization. The paint-pot imparts a freshness and bloom of youth to the jaded boiler of twenty years' service that is well calculated to stagger one's belief in "wear and tear," and doubt if there is any such thing as "fatigue in metals."—*Industrial Record.*

The area of the Dominion, according to a return recently issued by the Department of the Interior, is 3,406,542 square miles. The Customs receipts at Winnipeg for November showed an extraordinary increase, amounting to nearly 30 per cent., as compared with the corresponding month last year. During the ten months ending 31st October, 5,404,200 yards of woollen goods were imported from Great Britain, as against 3,862,400 in 1880. Cotton goods also show a large increase during the same period, the number of yards imported being 45,064,000 in 1881, as against 35,912,700 in 1880. The Fraser farm at Kildman, near Winnipeg, bought a short time ago for 13,000 dols., was sold again within a week at an advance of 11,000 dols. From the 1st of July to the 30th November the revenue of the Consolidated Fund amounted to 13,801,342 dols., and the expenditure to 10,099,153 dols.

Hints on Pattern-Designing.*

Ornamental pattern-work, to be raised above the contempt of reasonable men, must possess three qualities — beauty, imagination, and order. 'Tis clear I need not waste many words on the first of these. You will be drawing water with a sieve with a vengenance if you cannot manage to make ornamental work beautiful. As for the second quality — imagination — the necessity for that may not be so clear to you, considering the humble nature of our art; yet you will probably admit, when you come to think of it, that every work of man which has beauty in it, must have some meaning in it also; that the presence of any beauty in a piece of handicraft implies that the mind of the man who made it was more or less excited at the time, was lifted somewhat above the commonplace; that he had something to communicate to his fellows which they did not know or feel before, and which they would never have know or felt if he had not been there to force them to it. I want you to think of this when you see—as, unfortunately, you are only too likely often to see—some lifeless imitation of a piece of bygone art, and are puzzled to know why it does not satisfy you. The reason is that the imitator has not entered into the soul of the dead artist; nay, has supposed that he has but a hand and no soul, and so has not known what he meant to do. I dwell on this because it forces on us the conclusion that if we cannot have an ornamental art of our own, we cannot have one at all. Every real work of art, even the humblest, is inimitable. I am most sure that all the heaped-up knowledge of modern science, all the energy of modern commerce, and all the depth and spirituality of modern thought, cannot reproduce so much as the handiwork of an ignorant, superstitious Berkshire peasant of the fourteenth century; nay, of a wandering Kurdish shepherd, or of a skin-and bone oppressed Indian ryot. This, I say, I am sure of; and to me the certainty is not depressing, but inspiriting, for it bids us remember that the world has been noteworthy for more than one century and in one place—a fact which we are pretty much apt to forget. Now as to the third of the essential qualities of our art—order. I have to say of it, that without it neither the beauty nor the imagination could be made visible: it is the bond of their life, and as good as creates it, if they are to be of any use to people in general. Let us see, therefore, with what instruments it works, how it brings together the material and spiritual sides of the craft.

I have already said something of the way in which order deals with the materials which nature gives, and how, as it were, it both builds a wall against vagueness and opens a door therein for imagination to come in by. Now, this is done by means of treatment which is called, as one may say technically, the conventionalising of nature. That is to say, order invents certain beautiful and natural forms, which, appealing to a reasonable and imaginative person, will remind him not only of the part of nature which, to his mind at least, they represent, but also of much that lies beyond that part. I have already hinted at some reasons for this treatment of natural objects. You can't bring a whole country side, or a whole field, into your room, nor even a whole bush; and, moreover, only a very specially skilled craftsman can make any approach to what might pass with us in moments of excitement for an imitation of such-like things. These are limitations which are common to every form of the lesser arts; but besides these, every material in which household goods are fashioned, imposes certain special limitations within which the craftsman must work. Now this must be clear to you, if you come to think of it. Give an artist a piece of paper, and say to him, "I want a design," and he must ask you, "What for? What's to be done with it?" And if you can't tell him, well, I dare not venture to tell you the name which his irritation will give you. But if you say, I want this queer place filled with ornament, I want you to make such and such a pretty thing out of these intractible materials, straightway his invention will be quickened, and he will set to work with a will; for, indeed, delight in skill lies at the root af all art. Further, this working in materials, which is the *raison d'être* of all pattern-work, still further limits it in the direct imitation of nature, drives it still more decidedly to appeal to the imagination. For example: you have a heap of little coloured cubes of glass to make your picture of, or you have some coloured thrums of worsted wherewith to build up at once a picture and a piece of cloth; well, there is a wrong and a wright way of setting to work about this; if you please you may set to work with your cubes and your thrums to imitate a brush-painted picture, a work of art done in a material wherein the limitations were as few and pliable as they are many and rigid in the one you are working in; with almost invisible squares or shuttle-strokes, you may build up, square by square, or line by line, an imitation of an oil-painter's rapid stroke of the brush, and so at last produce your imitation, which doubtless people will wonder at, and say, "How *was* it done?—we can see neither cubes nor thrums in it." And so also would they have wondered if you had made a portrait of the Lord Mayor in burnt sugar, or of Mr. Parnell in fireworks. But the wonder being over, 'tis like that some reasonable person will say, "This is not specially beautiful; and as to its skill, after all, you have taken a year to do what a second-rate painter could have done in three days. Why have you done it at all?" An unanswerable question, I fear. Well, such materials may be used thus, so clever are men; nay they *have* been used thus, so perverse and dull are men! On the other hand, if you will, you may thoroughly consider your glass cubes or your worsted thrums, and think what can best be done with them; but they need not fetter your imagination, for you may, with them, tell a story in a new way, even if it be not a new story. You may conquer the obstinacy of your material, and make it obey you so far as the needs of beauty go, and the telling of your tale. You will be pleased with the victory of your skill, but you will not have forgotton your subject amidst mere laboriousness, and you will know that your victory has been no barren one, but has produced a beautiful thing, which nothing but your struggle with difficulties could have brought forth, and when people look at it they will be forced to say, "Well, though it is rough, yet, in spite of the material, the workman has shown that he knows what a good line is; it is beautiful, certainly, after its fashion, and the workman has looked at things with his own eyes; and then how the tesseræ gleams in this indestructible picture—how the gold glitters!" Or, "What wealth of colour and softness of gradation there is in these interwoven thrums of worsted that have drunk the dye so deeply. No other material conceivable could have done it just like this. And the wages are not so high; we can have plenty of this sort of work. Yes, the man *is* worth his keep." In this way, also, your materials can be used, so simple and trustful may men be that they may venture to make a work of art thus—nay, so helpful and joyous have they been, that they have so ventured, for the pleasure of many people, there own not least of all.

(*To be continued*)

* Part of a Lecture delivered by Mr. William Morris.

Jute in the United States.

Great efforts are being made to promote the cultivation of jute in the Southern States of the American Union, and the manufacture of jute bagging from native material. The New Orleans *Picayune* mentions the production of a roll of bagging on the looms of the Crescent Jute Manufacturing Company from jute grown on a plantation in the vicinity as a real triumph for the owner of the plantation. The problem to be solved, says the New Orleans paper, in order to induce the cultivation of jute in Lousiana and enable it to compete with the hand-made jute of India is the invention and perfection of the necessary machinery for use by the planters in preparing the fibre for the mills. A machine has been invented by a Mr. Spear, and has been put in operation on the plantation in question. The fibre which has been obtained is said to be remarkably strong, and the *Picayune* will not be surprised if it proves much stronger than the imported article. Mr. Putnam, the owner of the plantation, proposes to plant about 2,000 acres with jute.

The Manufacture of Gold Thread.

In the manufacture of Textile Fabrics, the use of gold has existed for more than 3,000 years. The earliest written information we have of its employment for such a purpose is in the Pentateuch, where mention is made of Aaron having vestments, amongst which was an ephod "of gold, violet, and purple and scarlet twice dyed, and fine embroidered work; and the workman cut also thin plates of gold and drew them small into strips, that they might be twisted with the woof of the aforesaid colours." But long before this time the use of gold in weaving undoubtedly existed amongst the Egyptians, and afterwards the work was carried on by the Medes and Persians, who became such adepts in this manufacture that their products were most eagerly sought after. On all great occasions kings and princes wore costly garments dyed in purple tints, and elaborately interwoven with gold. Later, the Chinese and the Indians worked gold into their fabrics, and continue to do so up to the present time. In our own country many examples of these textiles made in the tenth or eleventh centuries still exist. In the chapter library at Durham Cathedral may be seen a stole and maniple, which bear these inscriptions :—"Ælfflaed fieri precepit. Pio episcopo Fridestano." Fridestan was consecrated bishop of Winchester, A D. 905. With these webs under his eye, Mr. Ranie writes thus: "In the first the ground work of the whole is woven exclusively with thread of gold. I do not mean by thread of gold the silver-gilt wire frequently used in such matters, but real gold thread, if I may so term it, not round but flat. This is the character of the whole web, with the exception of the figures, the undulating cloud-shaped pedestal upon wich they stand, the inscriptions and the foliage for all of which, however surprising it may appear, vacant spaces have been left by the loom, and they themselves afterwards inserted with the needle." Throughout England, at the various cathedrals, vestments woven with an admixture of gold thread were generally worn, many of them being of great value. One texture called "samit" was a splendid web, wrought so thick and strong that each string, whether it happened to be of hemp or of silk had in the warp six threads, while the weft was of flat gold shreds. Dr. Rock, in his treatise on textiles, says that—"Intimately connected with the raw materials, and how they are wrought in the looms, is the question about the time when wire drawing was found out. At what period and among what people the art of working up pure gold, or gilded silver into a long round hair-like thread—into what may be correctly called "wire"—began, is quite unknown. That with their mechanical ingenuity, the ancient Egyptians bethought themselves of some method for the purpose is not unlikely. The first use of a wire drawing machine was about the year 1360, at Nuremberg; but it was not until 1560 that the method was introduced into England, but for long after this time the manufactured article was imported from India, Asia Minor, and the different countries in Europe, and more especially from France, where the people had a monopoly in the drawing of gold wire. In 1753, a contributor to the *London Daily Advertiser*, who, it seems, had been making enquiries into the manufacture of laces and brocades in France, speaks of the preference given throughout Europe to the brocades and laces manufactured in France, which were partly made from gold and silver threads. "In Paris," says the writer, "there is a Royal Society; all the men of abilities are in it, and scarce any others. The most considerable part of these are paid by their Sovereign for directing their talents to useful purposes; and what he has given in pensions they have repaid in the improvement of commerce." It is to these France owes its superiority in many articles of manufacture, and in none more than in the production of gold thread. "The perforated plates through which the precious metal was drawn into the form of wire were made of 'mixed metal,' the composition of which was a secret, and so much importance was attached to the speciality thus obtained, that the exportation of these plates from France was made a capital offence. But," says the writer already quoted, "as we can draw no wire without these plates, we must take means to procure them." These French plates were obtained, but yet the great difficulty remained "of imitating the use for which their inventors intended them." In an article on gold spinning in a recent number of the *London Standard*, reference is made to the above writer, and a full description of the process of wire-drawing is given. The article runs as follows :—"Looking back to the state of things which existed a hundred and thirty years ago, it is satisfactory to find that London is now able to compete successfully with Paris and Lyons in the production of the wire and the thread which once remained a special art with Continental cities. As descriptive of the present state of this manufacture in England, we will take one factory by way of example. Something of reservation and mystery still appears to surround this industry. The establishment, of which we speak, is one that may not be entered by everybody, and by no means cares to proclaim its precise character. In a quiet and secluded spot, only about five miles from London Bridge, is a quaint-looking structure, partly brick and partly timber, which, according to its appearance, might be taken for a paper mill, and yet it is nothing of the kind. It stands in the midst of pleasant grounds, with a broad sheet of water, some acres in extent, spread out before it, and with a stream running through it which serves to drive a mill-wheel, thereby setting in motion a number of machines inside, which, as a general rule, bear a strong resemblance to the machinery of a cotton mill. But the establishment, though of no great size, aspires to a higher dignity than that of cotton. . . . The name by which the establishment is generally known at the present day is the Silk Mills. But the title is in a great measure a misnomer, and was designedly adopted to hide the fact that something more precious than silk was to be found within its precincts. Here, then, is carried on the manufacture of gold and silver thread, including the preliminary process of wire drawing, and various subsequent operations connected with the industry. The foundation of the whole consists of three leading processes. First there is the drawing of the metal into the form of wire; secondly, this rounded wire has to be flattened into a tape-like form, but extremely minute; and thirdly, there is the spinning of the flattened wire round silk so as to form the thread.

(To be continued.)

Worsted Coating Manufacture in Bradford.

Within the past three years the manufacture of worsted coatings in Bradford has been wonderfully developed. The honour of introducing this new branch of business must be awarded to the firm of Sir T. Salt, Bart., Sons and Co., of Saltaire. Previously, worsted coatings had been made, and are still made, in Huddersfield and France. In competition with their French rivals, Bradford manufacturers enjoy an advantage from the use of the cap or fly spinning frames, inasmuch as the English frames turn off a more perfectly even thread than the French mule, thus giving a better appearance to the finished cloth Then Bradford wide-width worsted looms were found to be much better adapted for the manufacture of this species of goods than the woollen looms of Leeds and Huddersfield. The most serious sufferers, however, from the introduction of worsted coatings, are the clothmakers of the West of England, whose speciality has been almost entirely superseded by worsted coatings, and a heavy blow has been launched at union cloth used in the "slop" trade. It will thus be seen that worsted coatings have a wide range in styles and prices, from goods at about 2s. per yard to cloths suitable for evening dress. Bradford looms are now employed to a large extent in this particular department, which has afforded employment during all the recent slack times, and may be regarded as a valuable acquisition to the Bradford trade. Probably not less than 250,000 yards of worsted coatings per week are turned out at present in the Bradford district. In addition to the home trade, these coatings are largely exported, Italy taking the low goods; France and Belgium, strange to say, the better class; while America is a general consumer.—*Bradford Observer.*

Figured Cloth for Quilts, &c.

A new cloth, to be used principally for quilts, toilet-covers, antimacassars, mats, table cloths, curtains, and other similar articles, has lately been introduced by Mr. J. Warburton, of Bolton. It is composed of satin twill cloth made with one warp, while another warp makes a figure upon the said twill or satin ground; the second warp, when not in use for making figures, is used for making a satin twill or plain back. In carrying out the invention, a loom of ordinary construction is used, with tappet for making the weft satin face and twill back of the cloth and with jacquard for producing the figure; in some places the weft is turned to the back of the cloth, to be afterwards cut off. In weaving, eight or any number of shafts are employed to make the face satin of weft; also four or any other number of pressers to make the back twill satin or tabby. For instance, in making cloth with eight end satin face and four end twill back and figure thereon, the warp sheds, says the inventor would be as follows:—1.—The sixth face or satin heald is risen along with the jacquard. 2.—The third face or satin heald is risen, the jacquard still remaining up. 3.—The whole eight satin healds are risen, the jacquard still remaining up, and the first and fourth pressing healds or harness boards are lifted along with the third pick. 4.—The eighth face or satin heald is risen along with the jacquard. 5.—The fifth face or satin heald is risen, the jacquard still remaining up. 6.—All the face or satin healds are risen, the jacquard still remaining up, and the third and fourth pressing healds or harness boards are lifted along with this pick. 7.—The second face or satin heald is risen along with the jacquard. 8.—The seventh face or satin heald is risen, the jacquard still remaining up. 9.—All the face or satin healds are risen, the jacquard still remaining up, and the second and third pressing healds or harness-boards are lifted along with the ninth pick. 10.—The fourth face or satin heald is risen along with the jacquard. 11.—The first face or satin heald is risen, the jacquard still remaining up. 12.—All the face or satin healds are risen, the jacquards still remaining up, and the first and second pressing healds or harness-boards are fitted along with the twelfth pick. The above arrangement may be varied considerably as desired in the form of twill or satin face, or in the formation of back; in the above case every third pick is put in the back. Every fourth pick might be put in the back or any other proportion. The back may also be made with the machine instead of using pressing healds or harness-boards. In manufacturing cloth according to this invention, which has been patented, the satin or twill cloth is woven continuously from one warp at the same time that the floated yarn figure is produced on the surface by another warp, the body of the cloth and the figure being woven simultaneously, the figure warp being bound when at the back.

The Proposed Irish Exhibition Abandoned.

The proposal to hold an Irish National Exhibition has fallen through. At the adjourned meeting of the Executive Committee, under the presidency of the Lord Mayor of Dublin, seventy gentlemen attended, including the members for the county and city and the University of Dublin, and a number of other persons of high commercial and social standing, forming the majority in favour of Royal patronage. On the other hand were Mr. Dawson, M.P., Mr. Gill, M.P., Mr. T. D. Sullivan, M.P., and several others who take the Land League view of the matter. After a heated discussion, the Lord Mayor put the amendment, on which the meeting had adjourned the previous day, in the following terms:—"That considering the understanding arrived at at the Mansion House as to patronage, the question of asking Her Most Gracious Majesty the Queen to open or to be President of the Exhibition cannot now be honourably raised at the general meeting, and that the Belfast Committee be so informed" A division was taken at the instance of Mr. Dawson, when there appeared for the amendment 21, against 47. The amendment was declared lost Mr. Fisher, of Waterford, declined to vote. Mr. Richard Martin then moved—"That unless there could be a unanimous request from that meeting that the Queen should become patroness of the Exhibition the project should be abandoned." This was carried by 41 votes to 12, the remaining members of the Committee present declining to vote.

English Spinners and Continental Cotton Buyers.

One of the most important movements in connection with cotton buying is the experiment that is being made in purchasing the raw material at continental ports. Since the Liverpool corner created such a dearth in cotton, attempts have been made in Oldham to obtain supplies from abroad. In several instances successful purchases were made, and during the corner those companies which had bought cotton from abroad declared very high dividends. The cotton was bought at Havre, France, but we hear in some quarters that in certain respects some of the cotton did not come up to expectation. That being so another Continental port has been tried. This time it is Bremen, Germany, where the representative of a large Oldham limited company has gone to make a purchase of cotton. The cotton, it is said, is cheaper than can be purchased at Liverpool, even after the carriage, about $\frac{1}{8}$d. per lb., has been paid. The question is as to quality. Considerable interest is manifested as to how the speculation will turn out. There is one important point to be considered in connection with these continental cotton purchases. The cotton, having been stored for some time, is found to be dry, and in this respect there is a considerable advantage.

SCIENTIFIC AND ART NOTES.

The Prince of Wales has consented to lend his Indian collection to an exhibition, which is to be opened at Copenhagen in May.

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In turning steel or other hard metal, use a drip composed of petroleum two parts, and turpentine one part This will ensure easy cutting and perfect tools, when otherwise the work would stop, owing to the breakage of tools from the severe strain.

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Hollow steel shafting is being introduced into France. It is made by casting the metal round a core of lime, the ingot being finally rolled into shafting, the lime core going with it, and diminishing in diameter in the same proportion as the metal, even when the total diameter is reduced as low as one-fourth of an inch.

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The following is said to make a good varnish for labels. It dries in a few seconds, and produces a colourless, smooth and shining coat:—Saudric, 53 parts; mastic, 20 parts; camphor, 1 part; oil of lavender, 8 parts; Venice turpentine, 4 parts; ether, 6 parts; alcohol, 40 parts. The ingredients must be macerated for weeks until everything is dissolved.

* * * *

Messrs. Weitt and Merz, of Zurich, have been turning naphthalene, a beautiful white crystalline substance, but hitherto regarded as a waste product, to good account. The naphthalene colours produced by this firm are characterised by fine yellow and red tints, their latest discovery being a dye of a singular golden hue, to which the name of "sun-gold" has been given.

* * * *

An expenditure of £10,000 for the purpose of creating an Art Gallery has been decided upon by the Exeter Town Council. It is proposed to extend the museum which was erected in memory of the late Prince Consort. The Council sanctioned raising £3,000 for the necessary land, and determined to assist in the remainder of the work, the main part of which will be a building to cost £4,000.

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The Japanese have long been famous for the manufacture of paper especially for the finer and tougher sorts. One of their latest achievements in this line is the production of a paper belt, suitable for driving machinery, and said to be stronger than ordinary leather. Now that European machines are being adopted in that country, this invention will prove exceedingly useful, for the Japanese are inferior tanners, and do not make good leather.

* * * *

A practical engineer gives the result of his experience with dry plumbago as a lubricant for steam cylinders, which fully establishes its superiority over oil, tallow, &c., generally used for that purpose. The engine upon which the experiments were carried on was an 11 × 30 horizontal engine, with a piston speed of 300 feet per minute, and was worked to its full capacity To obtain the best results, the common oil cup was exchanged for a goblet-shaped tallow cup, with a lid, after which the piston and springs were taken out and cleaned. Before starting the engine, one-third of an ounce of finely pulverized plumbago was placed in the cup. The piston rod became coated with the plumbago soon after starting, and by noon the whole had passed from the tallow cup into the cylinder On starting in the afternoon, one-third ounce more was placed in the cup, with a like result. Soon after beginning to use it, a portion of the plumbago would be found remaining in the cup. To obviate this, about one ounce of water was poured into the cup, after the plumbago had been put in, when a decided improvement was observed, in that it could be fed into the cylinder as readily as oil or tallow.

ORIGINAL DESIGNS.

Our first plate is a design for an Axminster Carpet with border, to be coloured as follows: —The ground Dark Blue; the ornament in Crimson, Pink, Green, Tan and Ivory White, with touches of Yellow and Light Blue. This capital design is from the pencil of Mr. S. Garforth, of Lintle Field Terrace, Ovenden, near Halifax.

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We also give a double page design and border by Mr. Ezra Hoyle, of Sedgefield Terrace, Bradford, which may be used for a variety of purposes, but is perhaps most suitable for Silk Damask or Tapestry Hangings.

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*** We beg to inform manufacturers and others that adaptations of designs, published in the "Journal of Fabrics," can be made at the Office by experienced Designers, and that Original Designs can also be furnished at moderate charges.

TRADE REPORTS FOR 1881.

Wool.—During the past year the fluctuation in prices has perhaps been less varied than in any year within our memory. In the early part of the year the London sales of Colonial wools were distinguished by great steadiness and a general demand for all classes. The demand continued good while towards the last sale, when a brisk competition set in for all classes, and particularly those which were the most suitable for making goods which were in accordance with the prevailing fashion. Probably about twenty per cent. of the Colonial wool imported is deep stapled and cross-bred of various qualities, which would compete favourably with English wool in any case, but it has a decided advantage in the present state of the market, when softness and fineness are required. All the ordinary runs of cross-bred Australian wools are dearer than they were at the commencement of the first, and without going into details of the varieties we may say that the advance generally has been equal to about ten per cent. in all the districts where Colonial wools are used. In English wools the demand in January was satisfactory, but prices were unremunerative. At the beginning of February the consumption fell off considerably, but towards the latter end of the month the demand increased, with an increase also in prices. This feeling continued through March, but in April the consumption was rather restricted, owing to manufacturers reducing their time of working. In May a turn for the better took place, which may be attributed to the firmness of prices at the London sales, which so affected English wools that they advanced from ½d to 1d. per lb. This improvement continued, varying slightly in the different months, until November set in, when the demand again became rather restricted, but prices still kept firm, owing to the country rates and the activity displayed at the Colonial wool sales. The month of December was marked by a much quieter tone in the market, there being a softening tendency in the prices in some classes of wool, although dealers, having full confidence in the future, did not press sales.

Yarns.—In the yarn trade a state of apathy characterised the market until the latter part of April, when an improvement took place, which continued to the end of the year both in the home and export trades; prices in consequence improved. The export of yarn has increased generally, the return showing that during eleven months there had been an excess of two million pounds over that of the corresponding period of last year. This of course represents the yarn trade of the whole country. The export trade with France has not been so good, for reasons which explain themselves, but that of Germany has increased. It is somewhat difficult, however, to arrive at the real nature of the exports to Germany, as a large quantity of yarn is shipped to that country, which is re-exported to Russia and Austria.

Cotton.—The year just past has been one of mingled prosperity and adversity for the capitalist Perhaps with most spinners, manufacturers, and merchants, prosperity has had the upper hand, although not to a very large extent. From the minor markets profits and commissions have probably been a full average. The Indian, Chinese, and the Eastern markets generally have had a chequered fortune; these markets having a close and keen competition, the returns being unremunerative when taking into account the capital at present employed. At the beginning of the year the American crop was estimated to reach 6,000,000 bales only, cotton being then worth 7d per lb. for middling Orleans, rather a high figure. By the end of January prices had fallen ¼d.; a similar decline in the value of yarns taking place. The principal causes of this decline were the indifferent advices from the East, and a decline in Exchange. During February a further decline of ¼d. took place, printers falling 3d. per piece from January 1st. The decline was caused by the receipt of heavier estimates of the cotton crop; the market was very active during the month as a consequence of the fall. In March there was a further reduction of ⅜d., there being a corresponding fall in yarn and pieces. In April another decline of ⅛d. came. These continued reductions stimulated buyers, and the sales fully equalled the production. In May, cotton touched its lowest point, although there was a general impression that a further reduction would come. During May large orders for yarn and goods were placed at the current prices, delivery extending over a considerable period. From this time until October came in, the "corner" seemed to have much its own way. With slight reactions, the rise in prices was continuous in the face of heavy supplies, and the excellent promises of a large growing crop. An outcry against the "corner" was made, which resulted in short time amongst spinners, but to very little purpose, the only result being that they obtained a slight increase in prices for yarns. The "corner" closed in October, and yarn and cotton declined together, cloth remaining about the same rate In November a demand for printers set in, which continued to the close of the year. For 1882 the prospects are of a cheerful order.

Woollen.—The trade of the year just closed has been very satisfactory as far as the amount of business done is concerned, but rather unsatisfactory when taking into account the profits made. On all hands complaints have been made of the great difficulty experienced by those engaged in the trade, and of the inadequate returns received for the capital involved. With Germany very little has been done, because of the high tariffs. With France more business has been done, especially since June last, chiefly by merchants who have speculated considerably for exportation, hoping to reap a great advantage ere higher duties were imposed under the proposed new treaty. Foreign Governments kept the army cloth trade pretty brisk up to the latter part of April, when that department of the woollen industry fell off, but it slightly recovered towards the end of the year. The prospects for next year are considered fairly good. During some portions of the year a good business has been done with Italy, Austria, the Levant, and other Eastern countries, with the exception of Japan, with which country there has been a great falling off in the number and bulk of the orders given out. The Canadians have not operated as freely as in past years, nor have the United States merchants done as much business as they did with us last year. The chief countries that have taken more goods are Belgium. British North America, Italy, Australia, and South America, the Argentine Republic being the foremost.

Linen.—Towards the close of the year 1880, business presented a more cheerful aspect, but at the commencement of 1881 it got back into the old groove, and continued so for nearly six months; when a slight improvement took place in the demand, but without any corresponding improvement in prices until the autumn, a marked rise then taking place. Stocks are still heavy, however, and manufacturers will be much relieved to see their goods move off early. A great hopefulness pervades the market. As regards the export trade, according to Government statistics, for eleven months in the year, the trade with the United States, though less than that of 1880, has been considerably above the average for the last five years. The Continental demand for yarns, however, has fallen off considerably. These countries produce and supply for themselves at present under more favourable working conditions, and in some instances they compete seriously with us. It is the opinion of many, that cottons, now made with remarkable skill, are largely taking the place of linen goods; yet other competent judges consider, that notwithstanding the enormous production of cotton goods, there is as much flax spun in the world now as ever there was.

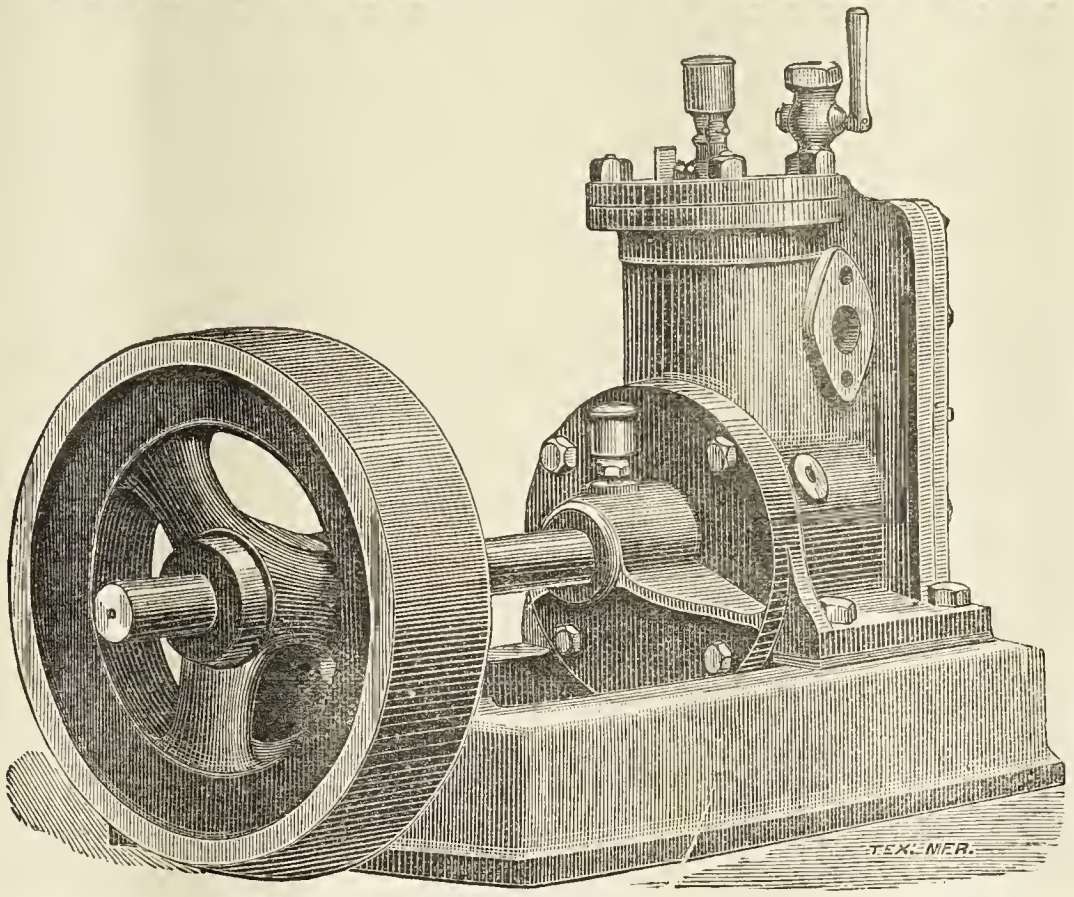
Carpets.—The carpet producing and selling season is supposed to be about at its height at the commencement of the year; and in January last the manufacturers' reports were of a very conflicting nature. Some reported the receipt of good orders for all classes, others for Dutch and Kidders, others for tapestry and Brussels; while others reported that they had made some good sale from stock, and thus cleared the way for next season's orders. In analysing the reports we are inclined to the opinion that there was a fair average business doing with some firms (in whose cases briskness prevailed), but the smaller manufacturers were badily off for orders; and in many cases, with little work and low rates, they had great difficulty in making ends meet. During the past two or three years a few firms have taken to the making of Brussels and tapestry carpets, and they find a ready sale for them. The low trade was flat until October, when there was a revival, and since that time to now there has been about an average season's trade. The greatest falling off in the shipments is to the United States, while the largest increase has been to British North America. The mild weather at the end of last year had a great effect on the sale of railway, carriage, and other rugs; and the cold weather came too late to be of service to manufacturers of this class of goods. Some very beautiful patterns have been sent out this season, and on the whole there are better prospects of increased trade.

Book Notice.

The Industrial Arts of India. By G. C. M. Birdwood, C.S.I., M.D., Chapman and Hall.

This work, one of a series of Art Handbooks issued under the authority of the Lords of the Committee of Council on Education, will, we are sure, be most heartily welcomed, not only by visitors to the South Kensington Museum, to which place the collection of examples of Indian handicraft originally formed by the East India Company have been transferred, but also by students, artisans, and manufacturers interested in the various industries treated of in the work. Part I. treats of the Hindu Pantheon, and has been compiled chiefly from well-known and reliable books, and then thoroughly revised from Professor Dowson's recent work—*The Classic Dictionary of Hindu Mythology*. Part II., which is a reprint, with added text of Dr. Birdwood's Handbook to the Indian Court at the Paris Exhibition of 1878, treats of the Master Handicrafts of India. It includes the following industries: —Gold and silver plate; metal work in brass; copper and tin enamels; arms; trappings; jewellery; art furniture and household decoration; woven fabrics and pottery. The books contain a fund of information, which cannot fail to be of great interest; even to the general reader, in addition to which there is a coloured map of India, and more than one hundred plates illustrative of the various subjects. We think Dr. Birdwood has succeeded most admirably in his work,

PRATT'S PATENT
PRIZE MEDAL "VELOMOTOR."



FROM ONE-HORSE UPWARDS. PRICES FROM £8 10s.

The following are a few of the advantages of this Desideratum, viz.:—CHEAPNESS, COMPACTNESS, and SILENCE in Working, even at a speed which in other Engines would be excessive.

CHEAPNESS.—Its first cost is considerably less than any other in the market.

SIMPLICITY.—Few working parts, no stuffing boxes, consequently a minimum of friction and maximum of durability.

DUST AND GRIT.—By reason of the working parts being enclosed within the air-tight Casing, these Engines will *run without trouble*, in the midst of GRIT, DUST and DIRT, in which it was previously almost impossible to adapt steam power.

SPEED.—Owing to the great speed at which these Engines silently work, there is no necessity for a number of counter shaft straps, pulleys, wheels, etc., to get "SPEED UP." In almost all cases, Machines, Fans, Centrifugal Pumps, etc., can be DRIVEN DIRECT, without cumbersome and costly gearing, thus being conductive to great economy, both in first cost and working expenses; the Engine, in most cases, being less in price than the necessary gearing and connections of other methods.

ADAPTABILITY.—They are specially useful for driving Machines which require to be driven singly, or placed apart, where it is difficult and costly to drive from the Main Engine, or in cases where it is required to run overtime.

WORKMANSHIP.—The workmanship and materials are of the best quality, SHAFTS, STEEL, and BEARINGS, PHOSPHOR BRONZE.

Horse Power.....	1	2	3	5
Revolutions	700	500	450	350.
Price.....	£8 10s.	£13	£20	£28

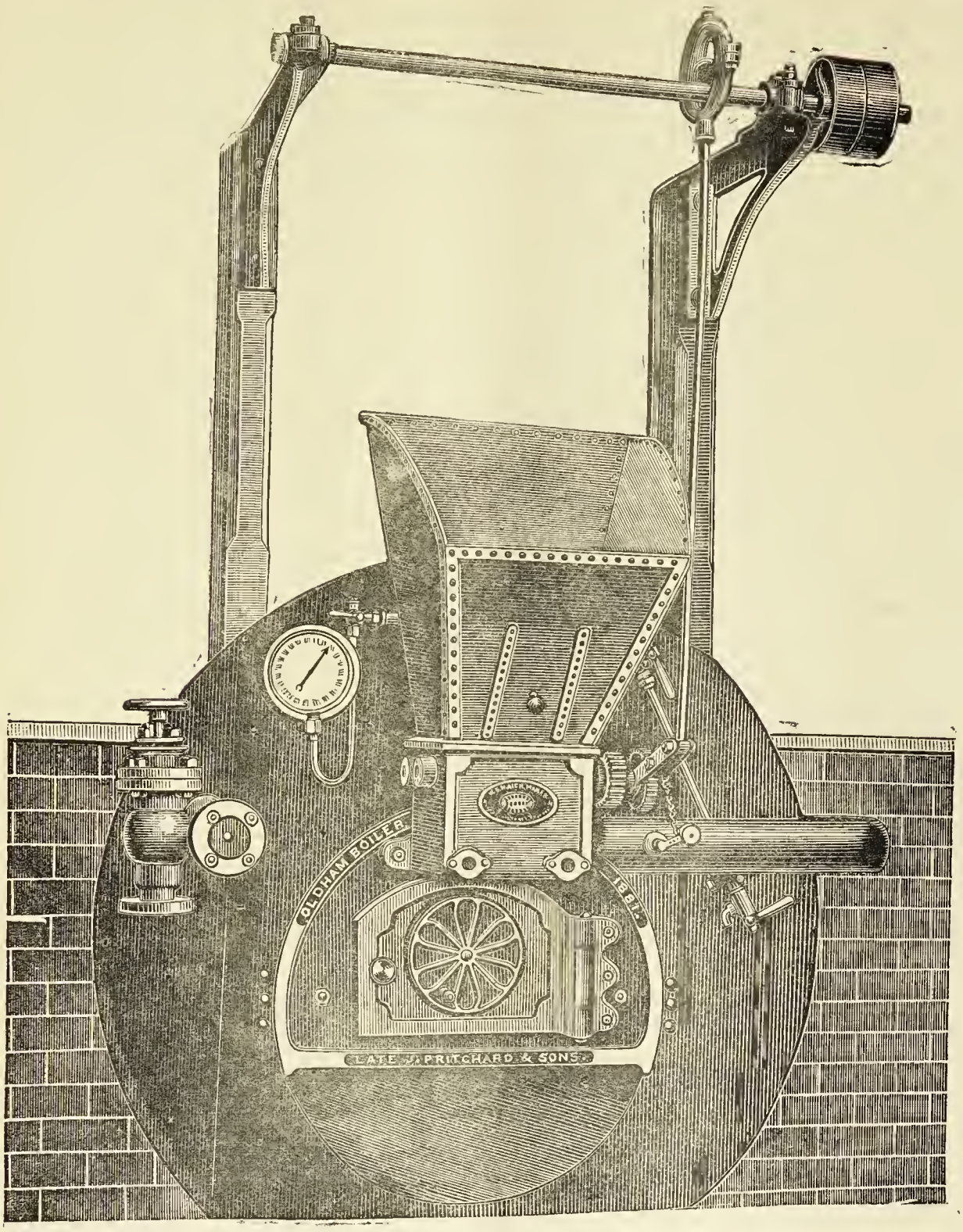
All the Engines above Two Horse Power are fitted with Equilibrium Throttle Valve and Governor; when these are not required a deduction will be made; above five-horse these Engines are made with two or more Cylinders.

THEY ARE PARTICULARLY ADAPTED FOR EXPORT, OWING TO THEIR LIGHT WEIGHT, AND THE SMALL SPACE THEY OCCUPY.

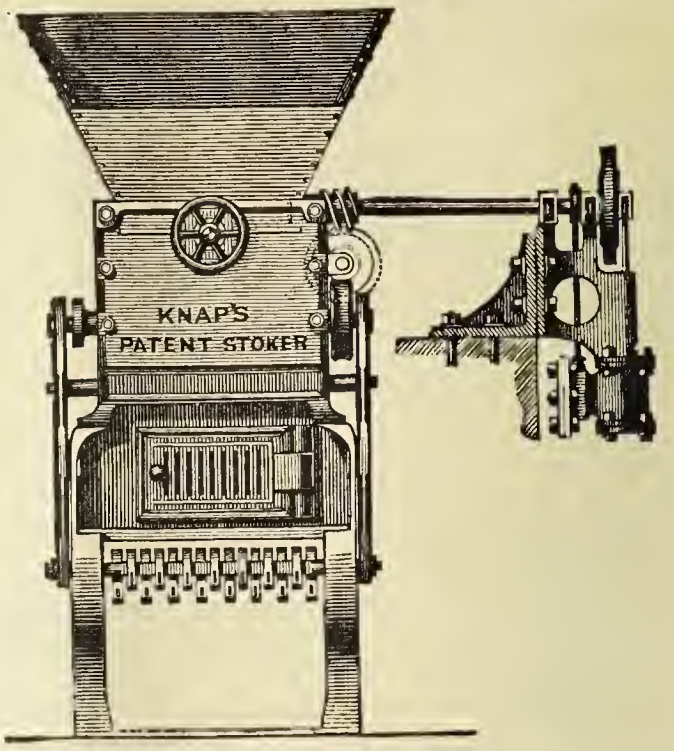
SATISFACTION GUARANTEED.

SOLE MAKER:

ALFRED YATES,
BLACK WALL WORKS, HALIFAX, ENGLAND.

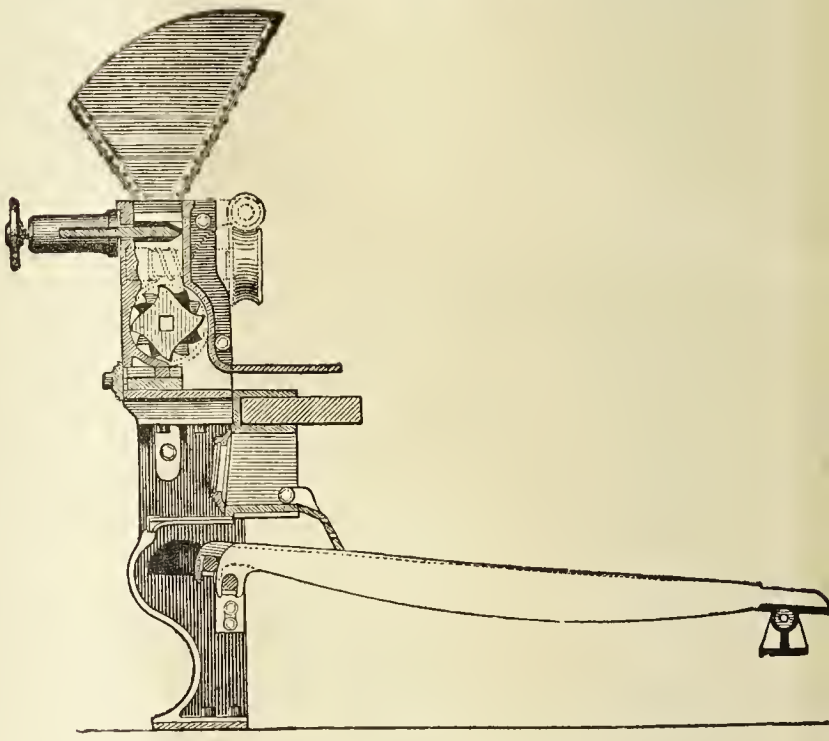


JAMES NEWTON & SON'S MECHANICAL STOKER.



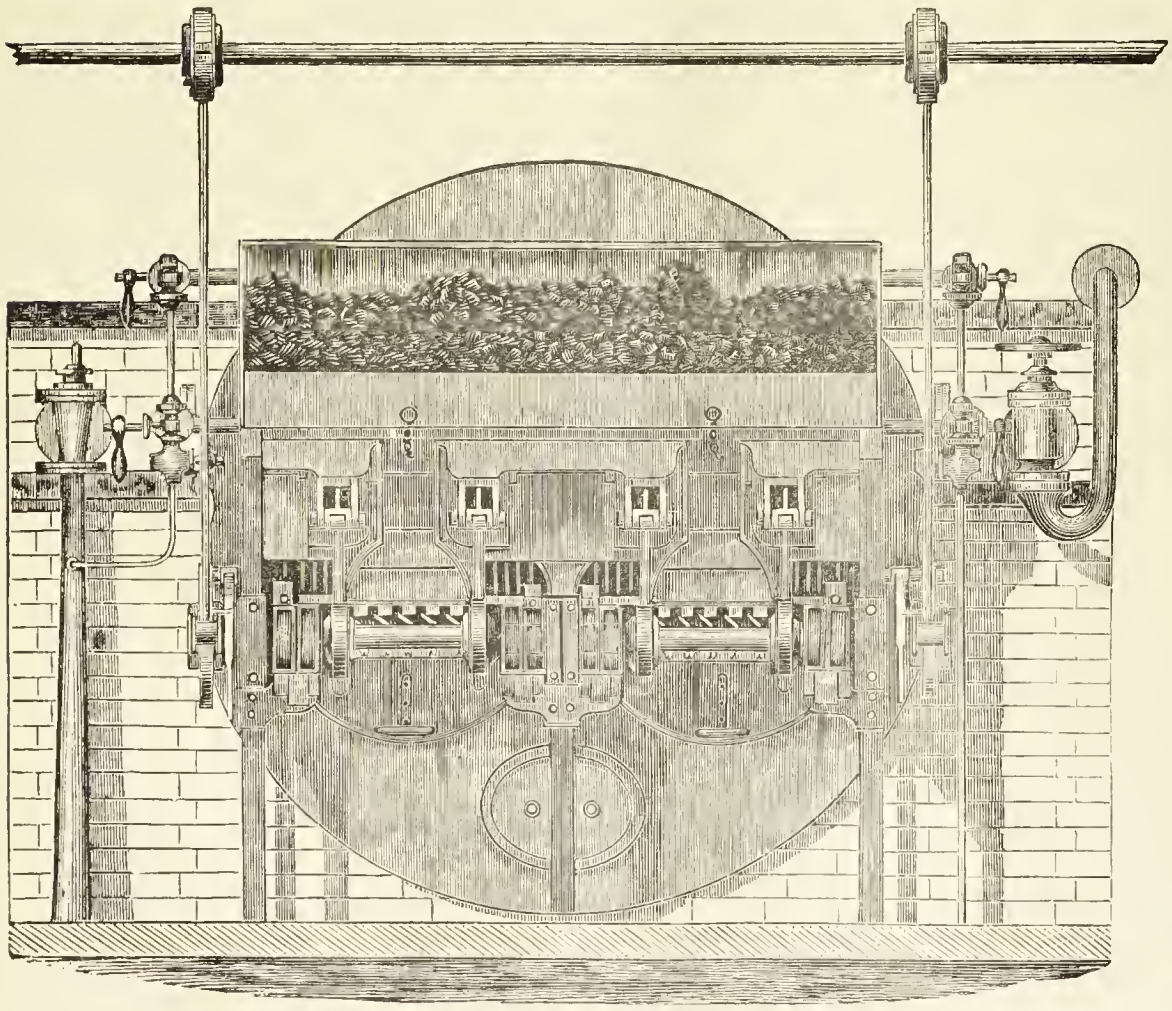
FRONT ELEVATION.

KNAP'S MECHANICAL STOKER.

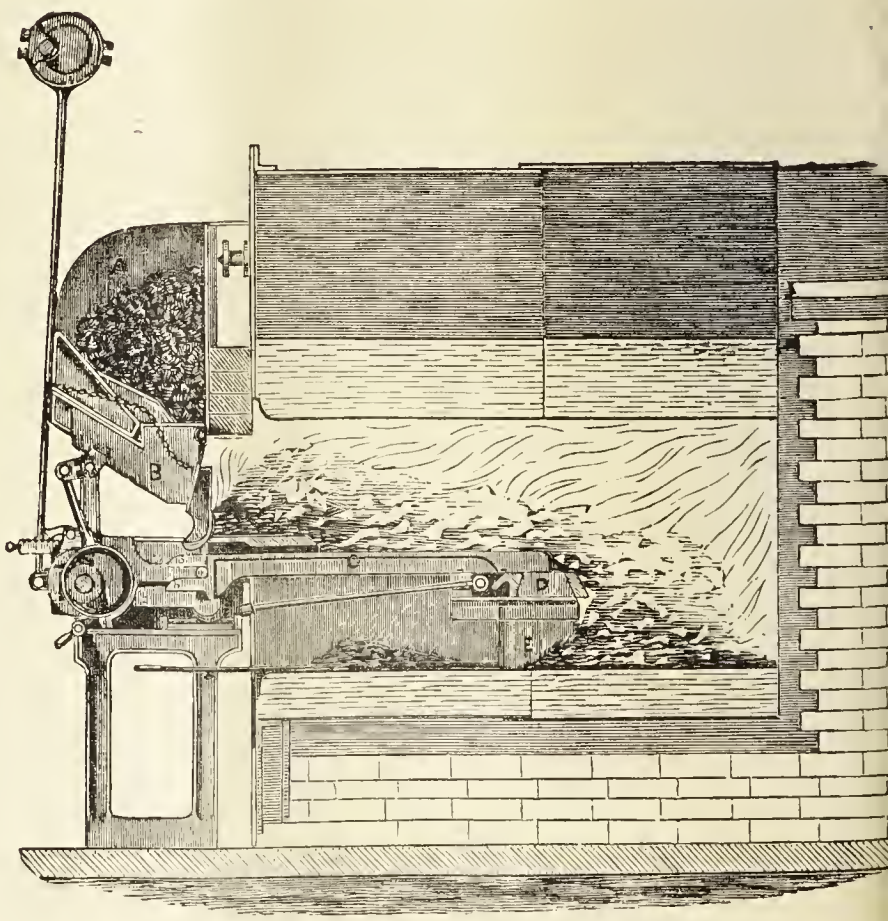


LONGITUDINAL SECTION.

KNAP'S MECHANICAL STOKER.



T. & T. VICAR'S MECHANICAL STOKER.

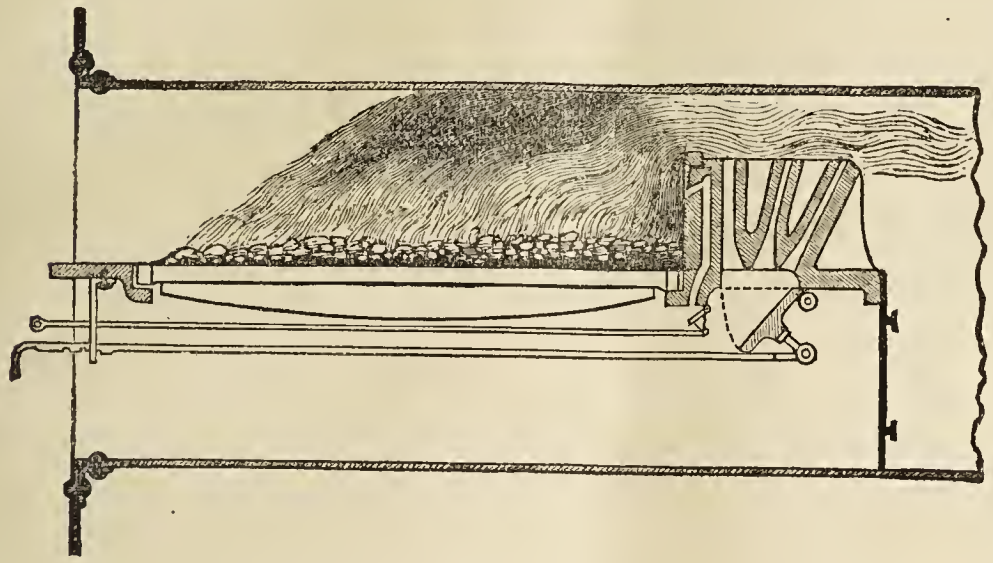


Smoke Abatement Exhibition.

Continued from Page 43.

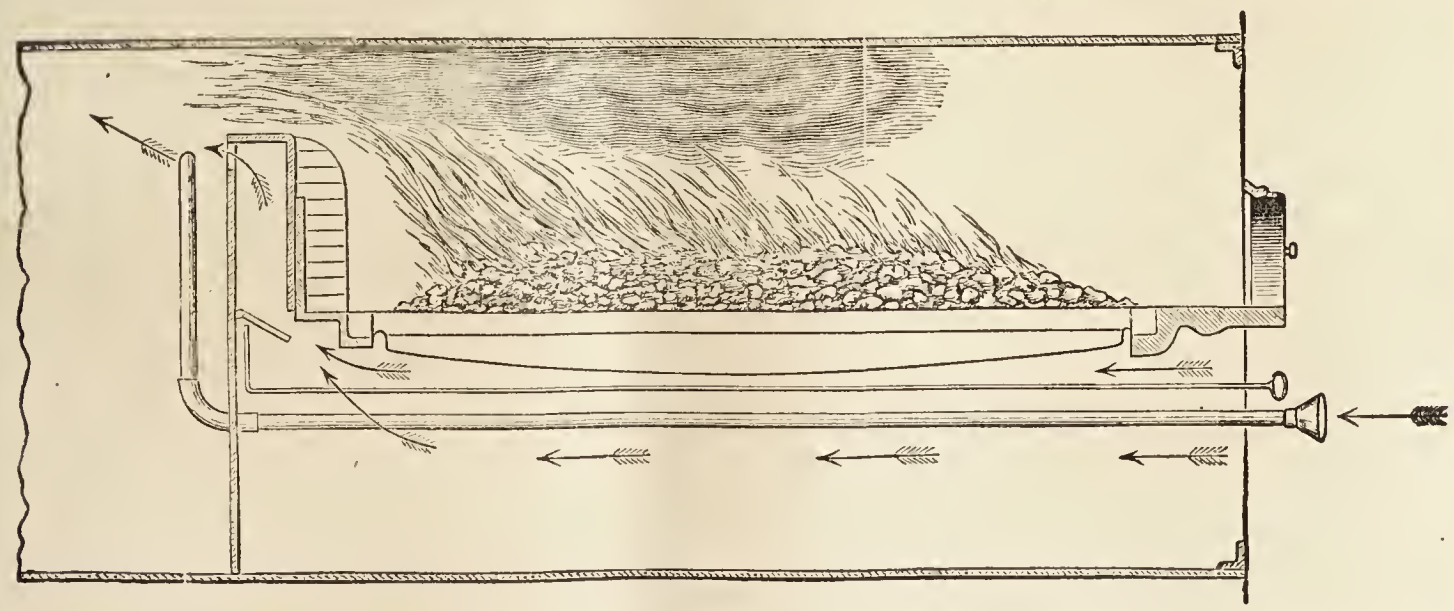
Since issuing our last number, the Committee of the Smoke Abatement Exhibition have spared no efforts in carrying out the very laborious and important task they have taken in hand, and it is a matter of no small satisfaction to them that they have been so far ably seconded by the exhibitors and the general public. At least 40,000 persons have visited the exhibition since the opening day. We give illustrations of a few of the exhibits on page 56,

Messrs. Chubb and Co., of 28, New Bridge Street, Blackfriars, London, exhibit their Patent Atmospheric Blast Smoke Consuming and Fuel Saving Apparatus.



The main object of this invention is to effect a saving in the consumption of fuel by entirely consuming the smoke and inflamable gases which are usually allowed to escape and to enable small coal to be used in place of large. This object is effected by admitting air in a suitable manner thrhoug the apparatus which forms the bridge to the furnace itself. This air becoming intensely heated, mingles with the unignited gases and smoke and produces a perfect combustion. The apparatus can be applied to any description of boiler, but is particularly applicable to Cornish and Lancashire boilers. It is in operation both in this country and on the continent, and judging by accounts from users of it, has given complete satisfaction in point of efficiency as an economiser of fuel and a consumer of smoke. The Government Inspector has spoken very highly of the patent. The following are some of the advantages of the apparatus:—It can be fixed to any boiler and set to work in three hours, no bolts or drilling of holes are required in the fixing, consequently the boilers sustain no damage whatever. It is easily removed to facilitate the examination of flues and is afterwards readily replaced. No special bars are required. Any low priced fuel may be burned without producing smoke, The first cost is moderate, as Messrs Chubb and Co. are both the manufacturers and patentees and have therefore no royalty to pay.

A very simple apparatus to effect the desired consumption of smoke and gases arising from the furnaces of steam boilers is shown by Mr. E. L. Gowthorpe, of High Pavement, Nottingham. From our engraving it will be seen that it consists of a *hollow bridge* placed immediately beyond the *furnace bars*, through which air, highly heated by passage below these *fire bars*, is allowed to pass. A valve or damper placed at the bottom is regulated by a rod leading in front of and immediately below the furnace doors. The outlet is placed at the top of the back plate, leaving the summit of the bridge intact, so that the air receives an inclined direction instead of a vertical one, which latter has been so often condemned by experts as tending to injure the boiler plates A second arrangement is placed beyond the *bridge* for the further consumption of smoke, consisting of bell-mouthed tubes placed on either side below the *furnace doors*; the tubes pass through the back plate, are then carried upwards and terminate in a single horizontal tube, in which there is a longitudinal orifice through which the heated air escapes, intercepting and consuming any of the smoke and gases which may have escaped combustion. The passage of air through these tubes is regulated by valves and plugs fixed at the mouth.



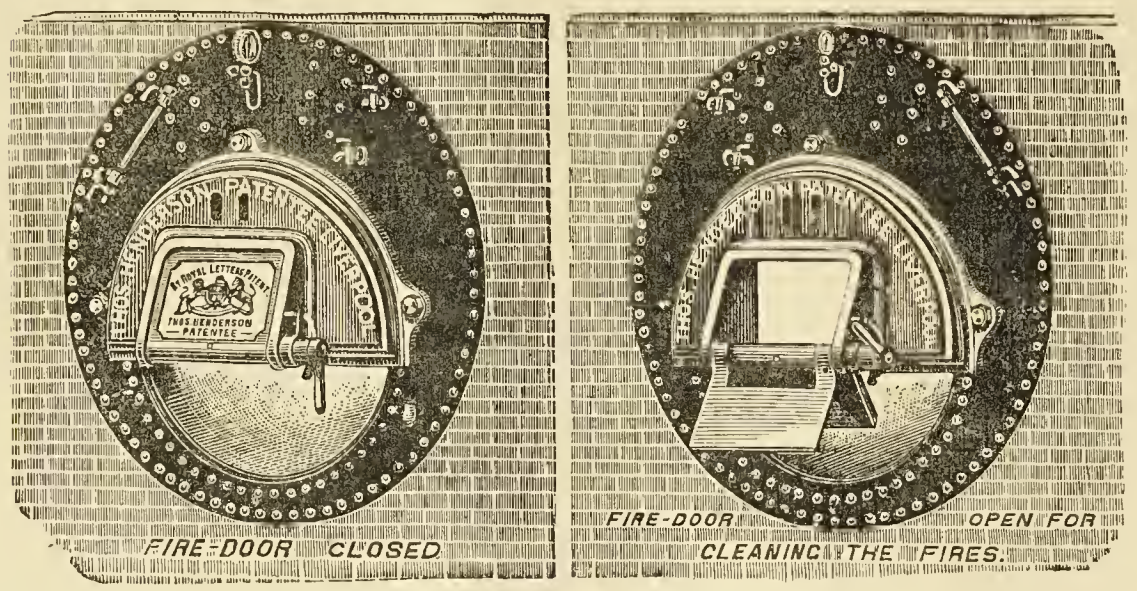
The advantages of this apparatus are: That whilst forming a permanent bridge practically indestructible, its simplicity renders it impossible to clog or get out of order, whilst its form effects a great saving in the expense of fixing necessary for ordinary bridges. To existing furnaces and fire bars it may be easily and quickly fixed without any alteration.

It not only effects perfect combustion of fuel and of the noxious vapours arising therefrom, but is very economical, seeing that the most inferior coal may be used to advantage, and by quite inexperienced stokers.

Messrs. Martin and Co., Pocock Street, Blackfriar's Road, London, exhibit Smoke-Preventing Doors and Furnace Grates. The patent doors open either inwards or outwards to any angle, and being balanced, are very handy. When set a few inches inward they cause the air to enter the mouth of the furnace at a low point, and to mix with the gases in the process of combustion (assisting the air that enters through the grate, which of itself is insufficient to ignite the gases of fresh fuel.) By this action combustion is improved and the development of smoke prevented. As a consequence of this steam is more easily maintained and economy effected. The doors are applicable to every description of furnace. The Patent Furnace Grates consist of fire-bars of taper section of either wrought or cast iron, having neither lugs nor flangers, and being kept in position by serrated or grooved bearers, which support them below the level of the dead-plate. By this arrangement the fire-bars can be drawn out. turned end for end, or replaced without interfering with the working of the fire Access to the fire from beneath is readily obtained, and the fire is raised by the use of the flat stoking-iron, the front bearing-bar serving as a fulcrum or leverage. The fire bars are always in one length, and it is impossible for them to become unseated and knocked up into the fire. By the use of the patent grate, the stoker is enabled to remove the dross from the furnace at the back. The coked coals are first raised to the front part of the furnace, the fire-bars are then drawn forward sufficiently to let the dross fall through into the ash-pit; after which the fire-bars are replaced and the fire levelled. By this means a banked fire can be brought into action instantly.

Messrs. James Newton and Son of Waterhead Mill, Oldham, whose factory we visited last month. exhibit their *Mechanical Stoker and Fuel Economiser*, the main principle of which is the forcing of the coal into the furnace by means of a hot air blast; all the details of the invention being subsidiary to this. The apparatus, an illustration of which we give—consists of an ordinary hopper, bolted to the door frame of the furnace, above the door, in such a way as not to interfere with the opening or closing of it. In the bottom part of the hopper are two horizontal-toothed rollers, about an inch apart, by means of which the coal is crushed sufficiently small and made to pass into two grooves or shutes pointing into the furnace. A blast of hot air is brought to the front end of these shutes by means of a sheet-iron tube passing through the flue underneath the boiler from a small fan at the back. This blast carries the coal forward through the shutes and spreads it in thin and even layers over the surface of the furnace. The shape of the fires can be varied by means of a depressing plate at the end of the shutes, and the force of the blast can also be regulated by means of a neat little valve placed in the tube This valve is worked from the lever which gives motion to the crushing rollers in the hopper, so that instead of a constant blast of air passing into the furnace, its admission is intermittent like the supply of coal. On the end of each roller there is a spur wheel about four inches in diameter which gears into the other. On the end of the front roller there is an ordinary ratchet wheel and lever worked by an eccentric, on an overhead shaft. which is driven by a pulley and strap from any convenient part of the shafting. The wheels and rollers, therefore. only work intermittently at each stroke of the eccentric. The revolving of the rollers which determines the supply of coal can be varied at pleasure by lengthening or shortening the ratchet boer, in which there are a number of holes for the purpose. The stoker can be applied to any description of boiler without—as is the case in many inventions drilling holes in the plates, and without the slightest alteration in the machine; the ordinary hand firing can be resorted to by simply disconnecting the valve taps, and throwing back the lifting fingers which work the crushing rollers; an operation that may be executed in a few seconds. The doors of the furnace can then he opened and the hand firing commenced We are bound to say that the machinery is of the simplest kind, there being absolutely nothing likely to get out of order, sufficient to cause any inconvenience. The machine has been in use more than two years at various factories in Lancashire, &c., in all cases having given great satisfaction; the economy in coal used having been proved in some cases to be from 15 to 20 per cent. in the total cost. The following are the principal merits claimed for the machine:—Its great simplicity and non-liability to get out of order; a minimum of wear and tear; great economy in the consumption of coal; an inferior quality of coal can be used; the non-emission of black smoke; the regularity in the supply of fuel and in the generation of steam; a great saving in labour, one man being able to fire about double the number of boilers; less damage to boilers from unequal expansion and contraction of plates, its light weight, and neat and ornamental appearance. For information to manufacturers, &c., we may add that the stoker can be applied to boilers at a moderate cost, and after being fixed, the power required to work it is very slight. We believe that the advantages of this machine over hand firing ones are undoubted, it having been most favourably spoken of by Dr. Sutton, Medical Officer of Health of Oldham, and other scientific gentlemen who have seen it at work.

Henderson's Patent Fire-door Company, 40, Castle Street, Liverpool, show their Patent Furnace-front and Fire-door, which is adapted to suit the furnaces of every description of land or marine boilers. The furnace front is constructed with a hollow chamber, having perforations to admit air, and so arranged as to pass a constant current of air through it into the furnace. By this means the front is kept cool instead of radiating heat into the stoke-hole, and the furnace is supplied with heated air, which, after circulating all over the furnace front,—in the hollow chamber between, and being heated by its passage through the chamber, it enters the furnace through perforations either over or under, or both over and under, the dead plate, according to the position in which the door is placed, thus insuring a more perfect combustion of the gases and preventing the formation of smoke. The front is provided with projecting cheeks or bearings in which the door and dead-plate (in one piece similar to a tell crank) are pivotted, leaving them free to revolve, and they are counter weighted so as to be in equilibrium, or nearly so, so that the door will remain in any position in which it may be placed. In our illustrations; Fig. 1 is a front elevation



showing the Patent Furnace-front and door as applied to a Cornish boiler, with the *door* closed. Fig. 2 is a similar front elevation, but in which the *door* is shown in position for cleaning out the clinkers. The manner of using is as follows:—The fireman pushes the door inwards, with his shovel or with a handle, he then fires up, and when done, changes the position of the door to what it was before. When cleaning the fires, he places it as shown in Fig. 2, which leaves an open space (ordinarily occupied by the dead plate) through which he can rake the clinker into the ash pit, while at the same time the door and dead plate prevent radiated heat from the incandescent clinker from entering the boiler room, and also act as a screen or guard to keep the heat from the stoker. The sulphur and other gaseous matters, with the hot air from the clinker, pass up through the opening left by the dead-plate into the furnace, and thence to the chimney, without contaminating the air of the stokehole. The fireman, in the meantime, can fire up again without the inconvenience of radiated heat from the clinker, and the sulphurous and other fumes therefrom, which in hitherto existing arrangements are so annoying

It will be readily acknowledged that the invention is in every respect far superior to the ordinary arrangement and it must be admitted that the carrying off of the sulphur and gaseous fumes generated by the clinker, instead of allowing them to escape into the stokehole, as well as reducing the temperature and obtaining a better circulation of air in the stokehole, are matters of great moment and of considerable importance, and this improvement must, therefore, prove a great boon and comfort to the firemen in their hot and stifling occupation, particularly on steam-ships, and especially to those going south, or into any tropical climate. The patent front and door can be used with the greatest facility, being not only simple in construction but handy and convenient. It may be seen in operation at numerous works in the various manufacturing towns, where it has been proved to be one of the most effectual appliances for the prevention of smoke.

The exhibits of the Patent Steam Boiler Company, of 28, Heneage Street, Birmingham, include Knap's Patent Mechanical Stoker and the "Root" Patent Safety Steam Boiler. Our engravings give a front elevation and a longitudinal section of the stoking apparatus which consists of a hopper into which the fuel is charged; a slide by which the supply may be at any time entirely cut off; a crusher spindle, which revolves very slowly and carries down the fuel to a reciprocating bar, which feeds the fuel forward through the horizontal shute. A perforated dead-plate is provided. The fire-bars are arranged with the alternate ones reciprocating. The action of the apparatus is as follows:—The fuel being carried down from hopper is pushed at a suitable speed through the shute. It then falls on the front of fire-bars. The smoke mingling with air from the dead-plate becomes consumed on passing over the incandescent portion of fuel. The fuel is gradually moved from the front towards the back of furnace by the action of the fire-bars. The feed of fuel is constant, and the condition of the furnace always the same. The apparatus is simple in construction and may be easily fixed to any description of boiler or furnace without any belt holes being drilled in the plates. It is entirely self-acting in all its parts and owing to its strength and simplicity is non liable or nearly so to get out of order and it may be instantly converted into a hand-firing furnace or *vice versa*. Fuel of any size or description may be used, any accumulation of large clinkers being prevented by the peculiar motion of the bars and any small ones that may form are kept in motion and carried over the back end of the bars into the ashpit. The patentee claims for his invention that a great saving in the consumption of fuel is effected, both in quantity and quality, that one-half the labour will suffice to keep the stoker working than is usually required, that the driving power required is very slight, and that the first cost is small in comparison with other efficient stokers.

The "Root" Patent Safety Steam Boiler consists of a series of interchangeable tubes of lap-welded wrought iron, containing the water and steam. These tubes having a zigzag arrangement thoroughly break up the flames and hot gases from the furnace, thus enveloping the whole of their outer surfaces and fully utilising the flames and gases before their discharge into the stack, and being inclined, cause the steam as produced to collect at the upper ends, and thence to pass through patent connections into the steam chamber. The tubes are of small diameter (5 inches) all of which are proved to 500 lbs. to the square inch. Provision is made by the use of elastic joints to counteract the evil effects of unequal expansion and contraction, and the joints being visible, no secret leakage can possibly take place—a desideratum of great value. Repairs can be made with great facility; any new tube can be replaced by another within an hour's stoppage of the boiler or in the absence of a new tube the connections can be detached from the defective ones, and the boiler set to work again in a short time—less than an hour. Owing to their portability they are particularly adapted for export. This boiler has been growing in favour both at home and abroad during the past three or four years, for its safety, economy and durability. We are not awaie that any accident to life or limb has yet occurred in the working of the boilers, although large numbers of them are now and have been working for more or less extended periods.

A Patent Self-stoking Smokeless Furnace, for steam boilers, is exhibited by Messrs. T. and T. Vicars, of Seel Street, Liverpool. Many improvements have recently been made in this furnace, by which the working parts have been reduced and much simplified, thereby reducing the wear and tear, which has greatly enhanced its value, although the makers have not increased its price, but on the contrary have reduced it. The action of the Furnace is as follows:—The large hopper A is filled with fuel, which is fed from thence by plungers B in suitable quantities on to the bars C, where it is coked, and, by their motion, carried backward on to the grated plate D, the ends of the bars act as plungers and break up the large pieces of coked fuel into a size favourable to active combustion, at the same time forcing it forward into the flue, where the combustion is completed; the clinkers and other incombustible matter descend to bottom of flue at E, from whence they can be easily removed at suitable intervals of time without opening the doors, as it is necessary to do in hand firing. The whole mechanism is now actuated by one ratchet wheel and cross shaft, which makes it more accessible for working, and leaves a large door for firing by hand during any temporary stoppage of the driving power, or lighting the fires. Another important feature is that a bar can be renewed at any time, in a few minutes, without stopping the boiler, and the bars being so short, their weight, and therefore cost, is less than common firebars. The rate of burning may be adjusted by varying the speed of the plungers and the motion of the bars which is very easily done. Very little power is required to drive the machine, the quantity of fuel passed on to the bars can be regulated to the greatest nicety, it requires very little attention, and as much steam can be produced from fine slack as from large coal of the same quality, thus in most cases effecting a great saving and at the same time the stoker is smokeless and self-cleansing. Messrs. Vicars have been for the past 16 years actively engaged upon experiments in endeavouring to perfect a Self-stoking Smokeless Furnace, and have during that time manufactured over 1,600 furnaces; so that it can hardly be said they are without experience in their work.

Woben Electrical Wires.

A novel mode of covering wire used for many electrical purposes has been devised by Professor A. E. Ayrton. The process is merely a modified form of weaving The wire, which may be German-silver, platinum, silver, &c., or simply copper or iron, if great cheapness of construction be desired, is wound bare on the shuttle and used as the weft, being woven backward and forward between parallel fibres of silk, cotton, or any suitable material employed as the warp. Or the wires may be arranged as the warp and the insulating material employed on the shuttle The web, whether composed of a warp of wires and a weft of insulating material, or a warp of threads of insulating material and a weft of wire, may, if desired, be steeped in or passed through a bath of bitumen or melted paraffin wax, or of other similar liquid, and an extra security of insulation and solidity is thus secured. It may be rolled or twisted up sideways to be placed in the bath. The web or ribbon, in the flat state as woven, can be easily painted with any fluid compound if desired, an ordinary paint brush being employed for the purpose, or the web or ribbon may be covered with gutta-percha or with some similar substance, by being passed through a die where the compound is under pressure.

MACHINERY, TOOLS, ETC.

The Salisbury Loom.

Amongst inventions which have been brought to aid the development of the woollen industry, a new loom invented recently at Providence, Rhode Island, and called the Salisbury Loom, has already received much attention from manufacturers and others interested in the textile fabric trade. A prime consideration is the cost of the machine itself, which is said to be much less than that of an ordinary loom of equal capacity Another important feature which is claimed for the loom is that the vibratory movement given by the backward and forward motion of the shuttle in ordinary looms, so destructive to the buildings containing them, is entirely obviated. The machine stands about 5 feet in height, is cylindrical in shape; it is similar in appearance and operation to a large knitting machine, but the work it turns out is entirely different;. the knitting machine for instance generally uses but one thread, and turns out a fabric capable of stretching to an almost unlimited extent, and travelling from end to end. The Salisbury Loom varies in the use of four threads—two warps and two fillings—and makes an exceedingly durable and compact material of the usual elasticity given to cloth. The material may be cut in any direction or shapes, leaving a perfectly raw edge that cannot be picked or unravelled. A light iron framework supports the machine proper. At the top is a cylinder, that by a peculiar device, can be enlarged in circumference or diminished according to the width of the cloth to be made. This cylinder contains 650 needles, the exact counterpart of knitting needles. The circumference of the cylinder of the machine referred to is 56 inches, producing a cloth of that width; in other words, equal to a 55-inch cloth of 650 picks, or nearly 12 picks to the inch. This cylinder contains ten knitting points, so that ten stitches are in course of construction at once; twelve revolutions are made per minute, and this rate easily produces ten yards of material per hour. The needles, in revolving with the cylinder, have an upward and downward motion given them by a series of stationary cams. If a wider cloth is required, the cylinder is enlarged by the addition of a greater number of needles, or extending the spaces between them as may be desired. Two or three needles are omitted in one portion of the cylinder, thus leaving a break in the stitches; down this the material is afterwards cut. Another advantage which this new loom is said to have over the old ones, is that with the latter it is necessary to stop the machine every few minutes, to supply the yarn to the small spools or cops, which are quickly emptied; whereas, on the new looms, large spools are used, which run for more than half-an-hour, thereby saving time by less frequent stoppage, and the necessary labour and machinery for preparing the warp, and filling yarns for common looms. In the event of breakage of one of the threads, a very ingenious automatic stop motion is provided; this is accomplished by short pieces of stout wire acting as weights; these are supported by the yarns in their passage from the spools to the needles. There is one weight to each thread, and in case of a thread breaking, the weight drops, and, guided by a tube, falls on a projecting lever, which being thus depressed, comes in contact with one of a series of studs placed on the revolving cylinder. On touching this stud, the movements of the machine act on a simple system of levers connected with a friction wheel, which immediately throws the motive power on to a loose pulley. The machine is checked in motion, and the power disconnected at the same moment; and it only remains to join the thread and proceed as before. Previous attemps have been made to construct looms on the same principle as the one we call attention to; the difficulty, however, hitherto has been, in dealing with the warp, which is necessary to give the material the requisite firmness. This is accomplished by using two yarns, and in the place of these two yarns lies the essential point of difference from the former attempts, and the success of the present machine.

Gallipoli Wool Oil Cream.

Great progress has been made during the past few years in the manufacture of oils specially adapted for use in the carding and combing of wools. It has been the aim of many makers to produce an article that would give a clean and bright appearance to the *top*, at the same time giving a good colour, producing a soft and full touch to the *yarn*, and a brilliant appearance to the *goods* when dyed and finished. From tests we made a short time ago with a combing oil patented by Mr Richard Cockshott, of Bradford, very satisfactory results were achieved. Mr. Cockshott claims for his speciality:—That it produces brighter colours in dyed and stoved yarns, than wools combed with the ordinary Gallipoli oils, and gives a better *spin*, and whenever used will effect a saving of 25 to 30 per cent (in the price of the oil) on dyed wools in re-combing, without the often objectionable tendency that many oils have of turning rancid and sticky in the wool. The wool retains its original colour and freeness for any length of time. Undoubtedly Mr. Cockshott's oil has superior advantages over other oils, and from the tests we have made, we can recommend it to the notice of manufacturers &c. of woollen and worsted fabrics.

ODDS AND ENDS.

The completion of the St. Gothard tunnel is officially announced. The cost of the undertaking from first to last has been £2,272,344.

* * * *

A Glasgow firm has purchased a weaving mill in France suitable for the making of the finer qualities of cloth. They wish to meet their French neighbours on their own ground, in the prospect of a heavy tariff being imposed on British manufactures.

* * * *

There will be a public meeting at the Mansion House on February 14, in connection with the Association for the Encouragement of British Woollen Manufactures, to consider what further steps can be taken to further the objects of the society.

* * * *

Kerr and Co., of Paisley, Scotland, manufacturers of spool cotton, have established an American factory at Newark, N.J., and although on a much smaller scale than their works in Paisley, there is no doubt that the support they will receive will quickly necessitate larger factories.

* * * *

The silk culture in New South Wales seems to be progressing very favourably. One firm has 5,000 mulberry trees to meet the demand for the silk worms. The new industry is having a fair trial, as in one district over half a million silk worms have reached the fourth stage without any appearance of disease.

* * * *

A "Calico Ball" is to be held in the Manchester Town Hall for the purpose of showing "the variety and perfection to which the important art of calico printing has advanced." The profits are to be given to the Warehousemen and Clerks' Orphan Schools. Business, art, philanthropy, and amusement combined!

* * * *

Under the title of *Mercur*, a Hamburg firm has brought out a new trade journal, relating specially to Germany's foreign trade. Issues of the new paper are to be sent gratuitously to 10,000 firms abroad. The first number appeared on the 1st of January, and the issue will be three times monthly, *i.e.*, on the 1st of the month in German, on the 10th in English, and on the 20th in Spanish.

* * * *

For a long time past researches have been made in Berlin with a view to diminish the fearful smoke, which disfigures part of this capital almost as much as London. The official inspector of manufactories has at length proved that excessive smoke is almost always caused by the unskilfulness of the stokers. It has accordingly been resolved that institutions shall be established to teach the art of making fires and keeping them up without creating the nuisance of excessive smoke.

* * * *

A very comprehensive historical sketch of the progress of the Philadelphia carpet mills was recently published in the *Commercial Bulletin*, a new and attractive trade journal in that city. Accompanying the sketch are tabular statements showing that forty-five mills, which started with only 253 power-looms and 521 hand-looms, now have 1,711 power-looms and 2,312 hand-looms, and produce 24,755,500 yards of carpetings per annum; while 161 other mills have 2,035 looms and produce 9 008,270 yards, making a total of 6,058 looms of all kinds producing 33,763,770 yards of carpetings. The forty-five mills first mentioned, manufacture more than 150,000 yards each per annum, and the *Bulletin* gives a detailed description of them.

A new company has been formed in Germany to buy and carry on the woollen yarn spinning mills known as the Swaine Mills of Meiningen. The purchasing price of the latter is 400,000 marks, and a further sum of 400,000 marks is to be expended on the extension of the mills. The total capital required by the new company is 1,500,000 marks.

* * * *

The directors' annual report is published by the Wurtemberg Calico Manufacturing Company for the year ending June 30 last, and shows profits on the year's working to the amount of 200,403 marks. A dividend of 11¼ per cent. is to be distributed amongst the shareholders, as against 11½ per cent in the previous twelve months.

* * * *

Owing to the adulteration of American cotton the profits of several spinning companies in Oldham are from 2 to 4 per cent. less during the year than they would otherwise have been. On the other hand, Oldham spinners find that the quality of Indian cotton is improving, while that of America is deteriorating.

* * * *

It is stated that the Pesth Woollen Entrepôt Company intend next year to inaugurate a first annual auction sale at Pesth for native wools. This project has been formed in consequence of the hesitation manifested by Austro-Hungarian buyers this season, and the consequent accumulation of wool stocks in the local warehouses.

* * * *

A commercial College has just lately been inaugurated under the auspices of the Paris Chamber of Commerce, and is, we are told, a splendid establishment. The title shows the aim of the institution, which is built to accommodate sons of merchants. It has already sixty pupils, of whom forty are graduates of the University, and provision has been made for admitting foreigners. The fees are 3,000 francs per annum.

* * * *

A species of wild silk worm has been found on the southern seaboards of the Chinese province of Kwanghing, which feed on the camphor tree, and whose silk is utilized in a singular manner by the natives. The worms are allowed to attain their full growth, when they are cut open and the silk is extracted in a form resembling catgut, which is subjected to a hardening process and made into fish-lines.

* * * *

Although the telegraph system was introduced into Japan but ten years ago, and has met with a great deal of opposition on the part of the superstitious natives, it is gradually coming into general use. There are now 3,929 miles of line and 9,345 miles of wire employed, with 348 Morse instruments, 26 needle blocks, and 29 Bell telephones. Twenty words are sent sixty miles for less than two cents, and last year the number of messages transmitted was 1.272.756.

* * * *

Switzerland, which has, like several other small States, hitherto refused protection or encouragement to inventors, is not unlikely to have a patent law before long. On the recommendation of the Federal Council the National Assembly is engaged in considering a Bill having this object in view. The proposed measure involving an amendment of the constitution, cannot become law without the sanction of the people. It is not considered probable, however, that this will be withheld, as a feeling has been growing in the country, that the present state of the law with regard to inventors is prejudical to the development of Swiss industries.

* * * *

Among the curiosities of the German Customs, what has recently been achieved by the ingenious officials of that service almost surpasses belief. They have contrived to double and treble the tax on many kinds of provisions imported, by simply taxing the wrappers and labels as essential parts of the consignment. Thus, cheese enveloped in silvered or tinfoil wrappers they now levy duty on as silvered wares. American corned beef in tins is taxed as fine iron wares. The latest feat of ingenuity in this direction is taxing Chinese liquors, essences, &c., which are contained in glass bottles covered with Chinese letters and figures on thin silk, as silk and satin.

* * * *

The *Journal de Genève* publishes the appeal issued by a central commission, which has been formed for organising a Swiss Industrial Exhibition, to be held in Zurich in 1883. The president of the commission is M, Ruchonnet, a member of the Swiss Federal Council, and the commission includes delegates from all the cantonal governments and representatives of all branches of Swiss industry. A site has been offered by the municipality of Zurich and accepted by the Commission, subventions have been accorded, and subscriptions have been promised from various parts of the country. A gratifying degree of interest in the undertaking is being shown by the most distinguished men in Switzerland. Agriculture, arts and trades, the great manufacturing industries, education, and other departments of Swiss activity are to be illustrated.

* * * *

The inhabitants of Bradford are in an especial degree indebted to Mr. S. C. Lister, of Manningham mills, for the very important addition to their industries in the manufacture of silk, &c. An adequate description of Messrs. Lister and Co.'s works would require a great space in our pages, but we may state that the firm import the raw material, manipulate it, dye and finish it ready for consumers, and that the articles manufactured are velvets, plushes, dress goods, sewing silks, and grey yarn for manufacturing purposes, such as is used for lace, ribbons, &c. The works cover about eleven acres of ground, and there are about seventeen acres of floorage. From 3,500 to 4,000 workpeople are employed, and the motive power is supplied by engines of 3,500 indicated horse-power, requiring twenty-three boilers, and necessitating a weekly consumption of coal of about 500 tons.

Foreign Competition.

Scattered through the consular reports just issued, there are some remarks upon the competition of foreign with English goods to which even at this late date it may be advantageous to to direct attention. Thus, speaking of the Spanish tariff, our Consul at Bilboa suggests that its discriminations against British goods have not been so injurious to us as was apprehended. It is stated, he says, that in spite of the tariff, "British manufactures are introduced as largely as ever viâ Germary, so that the injustice of refusing to England the most-favoured nation clause would seem to be practically of less consequence to the British exporter than might be supposed." That it is a serious disadvantage to us, however, says the *Economist*, cannot be doubted, and it is to be hoped that the recent advances of Senor Camacho will lead to a more equitable arrangement. The Belgian competition in iron goods is alluded to by Vice-consul March, who, writing from Santander, states that "the preponderance of Belgium in iron exports (to that port) is due to some of her leading manufacturers having secured the exclusive supply of railway material for the North of Spain railways. A keen competition is also going on between Manchester and Harburg-on-the-Elbe in engines." And from Teneriffe Consul Dundas gives "a few lines of warning as to the increasing introduction (into the Canary Islands) of French, German, and American articles to replace British. Too little attention," he writes, "is paid by us to ascertain the requirements of the markets and to introduce our goods. I am speaking of personal inspection and personal visits at regular intervals to observe and note the changes and the progress made by other competitors. The Americans are particularly active in thus introducing their products to the notices of merchants."

THE GAZETTE.

Adjudications of Bankruptcy.

May Thomas, trading as Lace, Fancy, and Trimming Company, 128, Rye Lane, Peckham, draper and milliner.

Barton William and Harry Barton, trading as Barton Bros., Westmoreland Buildings, Aldersgate Street, mantle manufacturers, W. Barton residing at 48, Moray Road, Finsbury Park, and H. Barton residing Marriot Road, Tollington Park.

Liquidations by Arrangement or Composition.

Heaton William, Mowbray Street, Leicester, dyer.

Johnson Matthew and David Pyrah, Thornhill Lees, near Dewsbury, woollen manufacturers.

Little Thomas William, trading as T. W. Little and Co., Leeds, woollen manufacturer.

Lumb Alfred, Upper George Street, Huddersfield, woollen cloth merchant, (separate creditors).

Pyrah David, Thornhill Lees, near Dewsbury, woollen manufacturer (separate creditors.)

Berry John William, Keighley, and Cullingworth, near Bingley, machine wool comber.

Brook Joah, Brighouse and Bradford, stuff manufacturer.

Smith James Hill, and Herbert Edward Smith, trading as R. W. Smith and Co., St. Luke's Street, Nottingham, hosiery manufacturers, and St. Peter's Street, Radford, Nottingham trimming manufacturers.

Tong Edward, trading as Haigh and Tong, Wakefield Road, Ossett, shopkeeper and manufacturer of blankets, linings and rugs.

Bayley William, Birmingham, Victoria Mills, St. John Street, late North Field House, Deane Road, both Bolton-le-Moors, cotton spinner.

Drake Wilkinson, 10, Trinity Road, Halifax, wool and waste dealer.

Horsfall John and Eli Horsfall, trading as Horsfall Brothers, Holme House Mill, Warley, Halifax, worsted spinners and manufacturers.

Fisher James Charles and Henry Schofield, 13, Knightrider Street, mantle manufacturers, J. C. Fisher residing at Friern Road, Peckham Rye, and H. Schofield at Evering Road, Upper Clapton.

Sequestrations.

Taylor and Johnston, 74, Buchanan Street, Glasgow, trimming merchants, and James Robertson Taylor and William Johnson, there, the partners of said firm, as such and as individuals.

Lornie David and Sons, spinners, &c., and David Lornie, jun., and Co., Pathead, Kirkcaldy, manufacturers, and David Lornie, sen., David Lornie, jun., and George Lornie, the partners and as individuals.

Trustees Appointed.

Frith John, and John West, trading as John Frith and Co. (Liquidation), Hollinwood, near Oldham, and Manchester, cotton spinners. Trustee, T. W. Gillibrand, George Street, Manchester.

Travis George, trading as Mayall and Travis (Liquidation), Poynton, Cheshire, and Manchester, yarn agent. Trustee, H. Wilton, Claremont, Moss Lane, East, Manchester.

Dividends.

Ellis Benjamin J. (Liquidation), St. John's, Worcester, woolstapler. 1st and final dividend, 1s. 5d.; F. Spooner, Old Bank, Worcester.

Hopkin Daniel (Liquidation), Thornton Road, Bradford, worsted spinner (separate estate). 1st and final dividend 4s.; on and after Dec. 23, between 10 and 4; J. W. Tempest, 2, Market Street, Bradford.

Robins Arthur J, trading as Constance Robins (Bankrupt), Barbican, skirt manufacturer. 2nd and final dividend, 3½d.; J. D. Viney, 99, Cheapside.

Tempest Isaac, William Turner and Daniel Hopkin, trading as Isaac Tempest and Co. (Liquidation), Thornton Road, Bradford, worsted spinners. 1st dividend, 5s.; J. W. Tempest, accountant, Market Street, Bradford.

Tempest Isaac (Liquidation), Thornton Road, Bradford, worsted spinner (separate estate). 1st and final dividend, 1s. 4d.; J. W. Tempest, accountant, Market Street, Bradford.

Turner William (Liquidation), West Holme Mill, Thornton Road, Bradford, worsted spinner (separate estate). 1st and final dividend, 1s. 4d.; J. W. Tempest, accountant, 2, Market Street, Bradford.

Chadwick John (Liquidation, Oakenrod, Lee Mill, Shawclough, Rochdale, woollen manufacturer. 1st and final dividend, 5s. 8½d.; H. Fishwick, Packer Street Chambers, Packer Street, Rochdale.

Shackleton William H., John Tomlinson, and Holmes Smith (Liquidation), trading as Shackleton, Tomlinson, and Company, Morton, Yorks., stuff manufacturers. 2nd dividend, 3d.; J. S. Colefax, Bradford, accountant.

Cheetham Thomas, and William E. Cheetham, trading as Cheetham and Co. (Liquidation), Nottingham, hosiers. 1st and final dividend, 3s. 4¼d.; H. E. Hubbatt, 6, Thurland Street, Nottingham.

Hawes A. H. (Bankrupt), Poultry, and Lower Clapton, hosier. 1st dividend, 1s.; on and after Jan. 2; C. L. Nichols, 1, Queen Victoria Street, Mansion House.

Hines Alfred, and Charles Harris, trading as Hines, Harris and Co. (Bankrupt). Manchester, skirt and costume manufacturer. 2nd and final dividend, 2s. 8d.; T. W. Handley, 52, Brown Street, Manchester.

Moore Zaccheus (Liquidation), Morton, near Bingley, worsted spinner. Dividend, 1s. 4d.; R. R. Priestley, 5, Little Horton Lane, Bradford.

Bills of Sale.

Barraclough F. A., The Fountain Finishing Works, Manchester Road, Bradford, stuff finisher, for £599 17s. 2d. to Ezra W. Hammond.

Kenworthy Charles Edward, 2, East Street, Rochdale, dyer and finisher, for £72, to Albion Loan, &c. Co.

Tolson John Edward, trading as Tolson and Co., Gladstone Mill, Earlsheaton, near Dewsbury, wool extractor, for £310, to Matthew Greenwood.

Brook Samuel Holdsworth, High Street, Cleckheaton, flannel manufacturer, for £36, to Simeon Kellet.

Dissolution of Partnerships.

Schofield, Lobley and Company, Batley, woollen manufacturers.

Rushforth William and Co., Westgate Common Mills, Wakefield, worsted spinners. Debts by William Rushforth.

Blackburn and Co., Portland Mills, Lindley, Huddersfield, woollen cloth manufacturers.

Twigg and Watson, 32, Cannon Street, Manchester, yarn merchants. Debts by Edward Twigg.

Allen John and Son, Bury, Lancashire, cotton waste manufacturers and merchants.

Cranwell and Co., Paternoster Buildings, Turkey carpet importers, &c. Debts by Frederick Cranwell.

Pape, Watson and Co., 2, Farmer's Factory, Nottingham, hosiery manufacturers. Debts by Joseph Radford.

Johnson T. F. and Son, Rumworth, Lancashire, cotton spinners. Debts by Sydney Marsland.

Marsden and Emmett, Blackburn, power loom cloth manufacturers. Debts by Timothy Marsden.

King H. and Sons, Royd Mill, Cowling, Yorks., manufacturers and commission weavers. Debts by John King

Kirkby Frederick, and Son Leeds, woollen merchants.

Locke and Sellar, Selkirk, tweed manufacturers. Debts by Arthur Sellar.

Anderson, Son and Co., Leicester, hosiery manufacturers. As regards George Anderson.

Scott and Bell, Wellington Quay, Dublin, silk mercers.

Whittingham J. and Co., Chapel Lane, Bradford, woolstaplers. Debts by Joseph Whittingham.

PATENTS.

Applications for Letters Patent.

5203 James Kerr and Joseph Haworth, Church, "Improvements in machinery or apparatus for printing fabrics."

5218 Frederick William Fox, Winthill, Yorkshire, spinners, "Improvements in the method of and apparatus for spinning, twisting, and drawing fibrous substances."

5223 George Pitt, Sutton, Surrey, "Improvements in ornamented fabrics, and in processes and apparatus for the manufacture of the same."—A communication.

5230 John Henry Johnston, 47, Lincoln's Inn Fields, Middlesex, "Improvements in the manufacture of cut pile fabrics."—A communication.

5258 Joseph Walton Merrall, Morton, Bingley, worsted spinner, "Improvements in rings employed in machinery for spinning and twisting wool, cotton, and other fibrous substances."

5263 Charles Denton Abel, 28, Southampton Buildings, Chancery Lane, Middlesex, "An improved manufacture of textile fabrics suitable for sackcloth and such like purposes, and apparatus employed therefor."—A communication.

5282 Edward Horsfall, Thornton Road, Bradford, yarn doubler, "Improvements in machinery or apparatus employed in the manufacture of fancy yarns."

5292 John Leyland, Bolton, spindle and flyer maker, "Improvements in the construction of apparatus for spinning cotton, flax, jute, worsted, and other fibrous materials, also for doubling and twisting the same."

5313 Benjamin Alfred Dobson, of the firm of Messieurs Dobson and Barlow, Bolton, machine maker. "Improvements in mules for spinning."

5314 Joseph Farrar, Halifax, machine maker, and Frederick Hungerford Bowman, Halifax, cotton spinner, "Improvements in spindles employed in spinning and twisting wool, cotton, and other fibrous substances."

5329 Charles Alfred Barlow, of the firm of Henry Bernoulli Barlow, Manchester, patent agent, "Improvements in the manufacture of machine embroidery."—A communication.

5330 Benjamin Alfred Dobson, of the firm of Messieurs Dobson and Barlow, Bolton, machine maker, and James Macqueen, of the same place, machinist, "Improvements in combing machines."

5335 William Robert Lake, of the firm of Heseltine, Lake and Company, Patent Agents, Southampton Buildings, London, "An improved apparatus for the manufacture of pillow-lace."—A communication.

5340 James Baird, Glasgow, manager to Messieurs John Brown and Son, power-loom manufacturers, "Improvements in looms for weaving gauze fabrics."

5342 John Hardaker, Grace Street, Leeds, temple manufacturer, "Improvements in temples for looms, and in apparatus or mechanism connected therewith."

5370 Francis William Parker, Crouch Hill, Middlesex, pattern book maker, "An improved mode of packing Swiss embroidery, laces, and other narrow trimmings for the market."
5378 William Henry Smith, Edward Smith, and John Smith, Kidderminster, "Improvements in and relating to looms for weaving."—A communication.
5384 John O'Neil, Unsworth-Whitefield, Lancashire, "Improvements in weaving reversible fabrics."
5410 William Sumner, Preston, spindle flyer ring maker and machinist, "Improvements in machinery or apparatus for preparing, spinning, doubling, and winding, cotton, wool, flax, silk, and other fibrous substances."
5412 John William Smith, Bradford, spinner, "Improvements in spinning and preparing machinery."
5423 Gustav Geissler, Kirkburton, Huddersfield, manufacturer, "Improvements in looms for weaving."
5535 Edwin Morley, of the firm of John Morley and Sons, Halifax, worsted spinners, and Hiram Jagger, manager, in the employ of the said John Morley and Sons, "Improvements in machinery for spinning fibres."
5546 Lorentz Albert Groth K.G.V., civil engineer and proprietor of the Scandinavian Patent Office, under the firm of L. A. Groth and Co., of 97, Finsbury Pavement, London, E.C., "A new or improved process and apparatus for softening hard yarn and other textile products."—A communication.
5594 Benjamin Joseph Barnard Mills, of the firm of Harris and Mills, of of 23, Southampton Buildings, Middlesex, patent agent, "Improvements in knitting machines or looms."—A communication.
5626 John Auchinvole, Glasgow, merchant, "Improvements in and connected with the bleaching and dyeing of yarns of wool, silk, or other animal fibres."
5645 John Walker, Hyde, "Improvements in the construction of machinery or apparatus employed for preparing and spinning cotton and other fibrous materials."
5658 Edward Hollingworth, manager in the firm of Hutchinson, Hollingworth, and Co., Limited, of Dobcross, woollen loom makers, "Improvements in the construction of pickers employed in looms for weaving.
5678 Matthew Wright, Wibsey, spinner and manufacturer, "Improvements in spinning machinery."
5691 Charles Alfred Barlow, of the firm of H. B. Barlow, Manchester, patent agent, "An improved method of trueing the surfaces of the cylinders of calendering and finishing machines."—A communication.
5711 William Thomas Stubbs, Manchester, machine maker, and John Corrigan, of the same place, manager, "Improvements in machinery or apparatus for winding two or more yarns or threads of cotton and other fibrous materials on to one bobbin or spool."

Grants of Provisional Protection for Six Months.

3747	4906	4908	4954	4960	4972	4980	4984
4986	4987	5013	5031	5059	5068	5086	5089
5092	5114	5115	5132	5134	5135	5152	5160
5161	5167	5174	5187	5188	5203	5218	5223
5230	5329	5335	5378	5384	5427		

Notices to Proceed.

3316	3398	3503	3575	3598	3625	3718	3728
3758	3789	3842	4272	4422	4433	4464	4587
4588	4613	4624	4697	4710	4732	4813	4897
4906	4908	5167	5313	5330	5331	5335	

Patents on which the Stamp Duty of £50 has been Paid.

4985 Thomas Bispham Kay, Bolton-le-Moors, engineer, "Improvements in machinery for combing and preparing cotton and other fibrous materials."
5111 John Holroyd, Manchester, engineer, "Improvements in machinery or apparatus for plaiting or kilting fabrics,"
5219 Thomas Marsh and John Clayton, both of Ashton-under-Lyne, "Improvements in the spindles of spinning machinery, and in the method of and arrangements for mounting and lubricating the same."
5225 James Bingham Alliott, Radford, Nottingham, and John Charles Vanlohe, Manchester, "Improvements in apparatus for and methods of bleaching and drying cotton, flax, and other vegetable materials and fabrics, partly applicable also to dyeing."—Partly their own invention and partly a communication.
5226 Frederick Wilkinson, Manchester, yarn agent, "Improvements in bleaching and dyeing cotton and other fibrous materials, and in machinery or apparatus connected therewith."
5227 John Petrie, junior, Rochdale, machine maker, and John Fielden, of the same place, mechanical engineer, "Improvements in machinery or apparatus for drying wool and other fibrous materials."
5253 William Wood, Dukinfield, bobbin maker, for an invention of "Improvements in bobbins adapted for use in the spinning of fibrous materials."
5269 Reuben Calvert Stephenson, Bradford, machinist, "Improvements in looms for weaving."—A communication,

Patents on which the Stamp Duty of £100 has been Paid

4119 John Boyd and Thomas Alexander Boyd, Shettleston, North Britain, engineers, "Improvements in machinery for winding yarn or thread."
4236 John Thom. Birkacre, Chorley, calico printer, "Improvements in ageing printed fabrics, and in apparatus connected therewith."
4471 John Brigg, Lower Crumpsall, Manchester, engraver to calico printers, Richard Hudson, of Chorlton-cum-Hardy, Manchester, designer, and Henry Grimshaw, Manchester, hatter, "Improvements in ornamenting and transferring patterns to fabrics."

Patents Sealed.

2556 James Carroll, Bradford, "Improvements in combing machines."
2571 John Pickering, Batley, heald maker, "Improvements in looms for weaving."—A communication.
2736 John Baldwin, William Baldwin, Robert Haddon, and James Crossley Dyson, all of Halifax, "Improvements in machinery for combing wool and other fibrous substances."
2794 William Henry Beck, 139, Cannon Street, London, consulting engineer and patent agent, "Improvements in looms for weaving."—A communication.
2837 William Edward Gaine, Glendale, Rivercourt Road, Hammersmith, Middlesex, "Improvements in dyeing."
2866 Frederick Orlando Tucker, Hartford, Connecticut, United States of America, "Improvements in looms for weaving."
2958 John Bullough, machine maker, Edmund Tweedale, manager, and Samuel Tweedale, foreman mechanic, Accrington, "Improvements in looms for weaving."
3243 George Little, Oldham, mechanical engineer, "Improvements in machines for combing fibres,"
3709 Thomas Arthur Duncan, Otley, of the firm of William Ackroyd, worsted spinners, "Improvements in flyers used in spinning and doubling fibres."
3717 Joseph Winter, Farnworth, Lancaster, spinner and manufacturer, and Thomas Ivers, of the same place, mill manager, "Improvements in the manufacture of cotton cloths known as cotton cords."
3874 Elias Smethurst, Manchester, "Improvements in the construction of looms for weaving."
3918 Edward John Vavasour Earle, Berners Street, Oxford Street, Middlesex, foreign goods importer, "An improved construction of case for the reception of embroidered and other trimmings, lace, and woven bands."
3996 Alfred Yates, Imperial Chambers, Derby, "Improvements in the twisting, doubling, or like manipulation of cotton or other fibrous material, and in means or apparatus employed therein."
4015 William Mather, of the firm of Messieurs Mather and Platt, Salford Iron Works, Manchester, "Improvements in the manufacture of velvets and other pile fabrics."
4071 Thomas Bottomley, Buttershaw, Bradford, spinner and manufacturer, "Improvements in the manufacture of leno or gauze cloth."
4072 Frederick Albert Gatty, Accrington, dyer and calico printer, "Improvements in the manufacture of coloured sized yarns."
4105 Rudolph Spöndlin, Zürich, Switzerland, "Improvements in the method of winding thread on cop-tubes or spools, and in mechanism therefor."—A communication.

Copyright of Designs.

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374,059 62	Beith, Stevenson, and Co., 14, Bridge Street, Manchester.
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374,240	Boden, Terras and Co., Manchester.
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374,827	S. and F. Sternberg, 39, Dickinson Street, Manchester.
374,976	Edmund Potter and Co., Manchester and Dinting.
375,147	Beith, Stevenson and Co., 14, Bridge Street, Manchester.

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A Design for a Kidderminster or Scotch Carpet.
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The Patent Laws.

There aro two points of view from which the Patent Laws may be regarded—that of the inventor, and that of public policy. It would be possible to expand the considerations which naturally range themselves under the first head into ponderous tones. To tell of the sleepless vigils of the "oppressed genius"; his wants of the common necessaries of life through the exhaustion of his means which have been devoted to the development and perfecting of his darling idea; the heartbroken wife, and neglected children; the grinding and almost brutal bantering to which the poor unfortunate found himself exposed on offering the right to patent his "notion" to some plethoric capitalist, in the event of not being able to obtain a "protection" for himself, on the one hand; or, on the other hand, if haply he was lucky enough to be able to manage the means wherewith to procure the patent for his invention, the callous indifference of a hard-hearted public as to the merits of his invention—these and all similar topics may be said to constitute the sentimental side of the question, which, although sufficiently interesting and pathetic, and justly entitled to our personal sympathy, are not of a character which would justify us in occupying the columns of a public trade journal therewith.

It is clearly therefore as a question of public policy alone that it must here be dealt with. In one form or other the question of the Patent Laws has engaged the deep attention of the manufacturing and industrial section of the community any time within the last 280 years from the days when Simon Sturtevant patented his "metallical inventions" in 1611 down to the present day, in fact. But as time progresses the nation progresses, and—significant fact—so do other nations too. That "Greater Britain," which is Trans-atlantic, has become, undoubtedly, one of the chief factors among the reasons which necessitate renewed consideration of the law as it affects patents, to say nothing of the increased activity of invention on our own shores, arising from increased intelligence, as well as from the effects of keener competition in both home and foreign markets. The Patent Laws as at present existing, like most of our English laws are not the result of one single grand conception. Like Topsy, they "never were born," they "growed"; but they have grown in such a form that had they been designed to discourage invention they could not have been better framed. The inventor—or rather the intending patentee—is hampered from the very first step he takes in a manner which seems to be systematic. The spirit of the law and, as a consequence, of its administrators, is one of persistent opposition, based on the theory that it is all done in protection of the interests of the public as against those of private individuals. Hence it is not surprising to find obstacles innumerable bestrewed in the path of would-be patentees. It is something, however, to find these obstacles are at length recognised and admitted by some of the best minds of the country, and even by the Government of the country, for Bills to remedy the existing defects have been brought in, in 1875, 1876, 1877, 1878, and 1879, and how many more it is impossible to say. But the chief difficulty in the way of successful legislation may be said to arise from want of agreement as to what should be remedied and in what way. In the meantime, at the outset, it strikes us that the cost attending the procuring of a patent is one that ought to be diminished very considerably if the spirit of invention is to be encouraged and maintained in the country. There are the agent, the counsel, and the fees for stamps which have all to be met and satisfied before the patent can be worked. But the agent and the counsel are by no means responsible for the cost which their aid involves, with them it is a question of procedure, and this depends upon the requirements of the law as it exists. It would be impossible within the range of even half-a-score articles to signalise what the whole of those requirements are, but, chiefest and foremost, it strikes us that the law as it affects specifications is a principal cause of the expense attending the services of both agent and counsel. A specification of whatever kind, even if it be one that has never been proceeded with, or the publication of any invention if found in the oldest book in the oldest library in the kingdom, is either of them a sufficient ground for taking away a patent after having been granted. This fact bespeaks the onerous nature of the duties of agent and counsel, if conscientiously performed, and until these conditions are ameliorated, it is hopeless to expect any serious reduction of cost in this direction. As to the cost attending the fees exacted by Government in the shape of stamps, there can be no doubt that fifty pounds just before the expiration of the third year of the patent, and a hundred pounds more just before the end of the seventh year constitutes a heavy tax in a great number of cases, and that, in all cases, it would be more equitable if the payments were spread over a greater length of time, and were allowed to be paid in correspondingly diminished instalments. Nor can there be any doubt that it would be good policy to reduce the fees in their aggregate; for these, with the preliminary fee of twenty-five pounds, make the by no means trifling sum of £175, which compares ominously with the £8 of the United States. Then, as to the duration of a patent, the utmost length of the term in Great Britain is 14 years, unless prolonged for 3, 5, or 7 years by the Court on special application — this prolongation never being accorded if the patentee has made £10,000 out of his patent during the 10 previous years, including all royalties and his own profits. Whereas, in the United States the term involving fees amounting to £8 lasts for 17 years! These facts may go a long way towards explaining the supposed greater ingenuity of our American cousins, and probably account for the existence of so many really ingenious "notions." It is, at all events, certainly owing to the increased facilities for securing the right to an invention that many a clever and useful discovery has crossed to the other side of the Atlantic, and has been thus lost to this country.

But not the least anxious and often vexatious part of an English patentee's troubles arises from his unceasing liability to law proceedings either in defence of his own rights, or at the instance of some other person who thinks that his rights are infringed. This position mainly springs from defects in the law, and might largely be prevented by better definitions of the rights of patentees; although, of course, no law written or unwritten will ever effectually prevent men from contending as to what they think is or ought to be theirs. There can, however, be no dispute as to the fact that the constitution of the tribunal before whom these law-suits in regard to patents are tried is responsible for much of the ruinous cost attending them, and this certainly ought to be remedied by imparting to them more or less of a practical character; and this remark applies equally to the tribunal which grants the patent in the first instance.

There are other points of importance affecting the position of patentees in this country which demand attention, and which will no doubt be amply discussed if once the subject can find its way before Parliament. There are three Bills in existence awaiting their chance of consideration—Mr. Anderson's, that of the Society of Arts, and that of Lord Beaconsfield's Government of 1879,—but "burning questions" have so long been the order of the day that it appears uncertain whether the subject will seriously be dealt with. In the meantime it is the duty of the commercial community to keep the subject alive, and to spare no pains to elucidate the exact position of so overwhelmingly important a matter; and this will be best done by earnest and temperate discussion, towards which our remarks are intended as a contribution.

Our Trade.

For some time past speculators and promoters have been free in their remarks about the want of energy and foresight shown by English capitalists and investors as compared with French. "They do things better in France. All the capital seems to be in Paris," was the stereotyped attempt at sarcasm. But slow as our capitalists and investors have been to learn a lesson—and though they may not yet have learnt it fully, they have done so partially—and what we now hear from France justifies the caution they have shown. It is sincerely to be hoped that the improvement in trade, which, though slow, seems to be steady, will not be checked and marred by some outbreak of wild and reasonless speculation such as has been too often seen in England. The revenue shows a considerable increase. The exports of home manufactures are 5 per cent. over those of 1880, and 20 per cent. over 1879. Most of our chief industries show activity, especially shipbuilding, though it must be said a considerable percentage of this is on French account, stimulated by the French bounty system. Railway traffic is becoming more satisfactory, the Clearing House returns are still growing rapidly, and failures wholesale and retail are diminishing. Finally, our best customers—our own Colonies—are not only growing in population and wealth with daily increasing speed, but they are developing trade most valuable to the mother country by an increasing interchange of commodities. Our Colonial trade is becoming of so much importance in the face of the hostile tariffs of foreign countries that before long even the most careless will be driven to appreciate the necessity for the adoption of some system which shall permanently strengthen the commercial bonds connecting us with our Colonies, and give them an interest in reducing their import duties.

Calico Printing.

There is no art which accords more with the spirit of the age than that of calico printing, writes a correspondent of the *Manchester Examiner*. To the scientist it affords an excellent vehicle for the practical employment of his most brilliant discoveries in the production by chemical reactions of colours formerly obtained by crude means from roots and barks. The artist is constantly appealed to for his best efforts in the production of beautiful designs, which are faithfully reproduced on fabrics, in colours which rival and excel his own. Even from the artisan is required a certain technical knowledge, as the ultimate success of the various processes depends entirely on the close observance of chemical formula. Calico printing, as it is now known, is of comparatively recent growth. There are many living who remember it as a long and laborious occupation; when the designs carved in relief on blocks of wood were printed by hand on the calico stretched over tables; when each colour was in this way printed or stamped, one after the other, and the workman or woman employed for the colour box a pad such as is now used for stamping trade marks on grey goods, with a lad to keep this supplied by means of a brush and pot of colour. Naturally, the designs or patterns were of the simplest character, as the various colours were guided to their position by pins affixed to the blocks, and the time and care required to fit the colours made the material too expensive to command an extended sale. The dyes and colours also were obtained by old-fashioned wasteful processes, and the whole production carried out by simple "rule of thumb," with no formula but such as was handed down from father to son, causing many of these processes to be regarded as family secrets, and consequently open to no improvement. The application of machinery and the spread of scientific knowledge, however, has changed all this. When master printers came to understand that the various changes in colours and dyes were subject to chemical laws they turned their attention to a scientific study of the materials they employed, and so found new and simple ways of arriving at their dyes, besides finding valuable uses for what had formerly been considered worthless residuum and run down the sewers. The connection once established between technical chemistry and calico printing has been the means of turning the attention of the scientist to this art in a marked degree; and the employment of machinery in printing was taken up so rapidly that block printing as an art is now extinct. Perhaps among the greatest triumphs of calico printing are the inventions for engraving the copper rollers used for printing the patterns on cloth. Even the practical mechanic would be lost in admiration at the beautiful and seemingly complicate machinery which will engrave automatically the most intricate designs. But it is chiefly in the production of the colours employed that the interest of this important art is centred. Those who have attended the science lectures instituted by Prof. Roscoe, will have remarked how often the end of chemical research was the discovery of new and brilliant colours Even the repugnant vile-smelling waste refuge of our gasworks has been found to contain mines of wealth under the analysis of the modern chemist. The invention of aniline colours from gas tar sounded the death knell of old-fashioned dyestuffs and rule-of-thumb processes. Colours which were difficult of production and impossible of employment, except under the most simple conditions, are now obtained by indirect chemical reactions, and made applicable to every requirement. Before this discovery, first used in a practical manner about twelve years ago, only certain colours could be printed together; and if others were required it was necessary to print them over again either by blocks, or machine. This entailed double labour; but now all these hitherto refractory colours can be produced together, allowing infinitely wider scope to the designer in his conception of patterns, and the printer in his choice of colours and combinations. It is easy to conceive that this discovery gave a great impetus to the art of printing. The designer, no longer trammelled by practical difficulties, could place his colours in whatever manner pleased his idea; the printer could combine these in new and beautiful ways, so that by rapid strides the productions of this art are now bidding fair to rival those of the painter. Again, the taste and beauty of these designs called forth choicer vehicles for expression than the plain calico hitherto regarded as sufficient. The cotton manufacturer was compelled to advance, and produce fabrics fine as gossamer, bearing themselves beautiful designs to appear in union with those of the printer. These were still not sufficient for the ever-advancing chemical art, for in all its processes it has now become the embodiment of practical chemistry. Those who will walk through our emporiums of fashion will see printed fabrics with the softness of satin and the lustre of silks, bearing designs which at the first blush appear hand painted, so closely do they resemble the works of nature in form and colour.

The Annual Conversazione in connection with the Salt Schools, Saltaire, was held on the 19th, 20th, and 21st ult. An additional interest manifested itself owing to the fact that the Countess of Bective and party had responded to the invitation of the Governers of the Institution, by being present on the 19th and 20th. The dresses worn on the occasion were of fabrics of British manufacture, a considerable portion being of Bradford make, and comprised cashmere, biéges, muslins, satins and sateens of very delicate shades: blue, pink, salmon, cream colour, and white predominating. The governers and others interested in the schools must be congratulated on the great success of the conversazione.

Hints on Pattern-Designing.*

(Continued from Page 51.)

Now, I have tried to point out to you that the nature of the craft of pattern-designing imposes certain limitations within which it has to work, and also that each branch of it has further limitations of its own. Before saying a few words that relate to these special limitations, I will, by your leave, narrow our subject by dwelling a little on what is one of the most important parts of pattern-designing—the making of a recurring pattern for a flat surface. Let us first look a little on the construction of these—at the lines on which they are built. Now, the beauty and imagination which I have spoken of as necessary to all patterns may be, and often have been, of the very simplest kind, and their order the most obvious. So to begin with, let us take one of these: our wall may be ornamented with mere horizontal stripes of colour; what beauty there may be in these will be limited to the beauty of very simple proportion, and in the tints and contrasts of tints used, while the meaning of them will be confined to the calling people's attention to the charm of material and due orderly construction of a wall. After this simplest form comes that of cheques and squares of unfoliated diaper, so to call it, which still is but a hint at the possible construction of the wall, when it is not in itself constructional. From that we get to diapers made by lines, either rectilinear or taking the form of circles touching one another. We have now left the idea of constructional blocks or curves, and are probably suggesting scoring of lines on the surface of the wall joined to inlaying, perhaps; or else there is an idea in it of some sort of hangings at first, as in much of the ancient Egyptian work woven of reeds or grass, but later on suggesting weaving of finer materials that do not call attention to the crossing of warp and weft.

This next becomes a floriated diaper. The lines are formed by shapes of stems and leaves, or flowers fill the spaces between the lines. This kind of ornamentation has got a long way from the original stripes and squares, and even from the cross-barred matting diapers. The first of these (when used quite simply) is commonly external work, and is used to enrich further what sunlight and shadow already enriches. The second either implies an early stage of civilization or a persistent memory of its rudeness. But as to this more elaborate diaper—for, simple as its construction is, it has never been superseded—in its richer forms it is intimately connected with the stately and vast shapes of Roman architecture; and until the great change took place, when the once-despised East began to mingle with the old, decaying Western civilization, and even to dominate it, it was really the only form taken by recurring patterns, except mere chequer and scalework, though certain complications of the circle and the square were used to gain greater richness. Here is an example of the strong hold this construction of pattern had upon Gothic art, and it is otherwise interesting as a specimen of traditional art grown stationery; for though it looks like a Lombard pattern of the twelfth century, it was wrought in Iceland towards the close of the seventeenth. Now, the next change, so far as mere construction goes, takes us into what is practically the last stage that recurring patterns can get to, and the change is greater than at first sight it may seem to you. It is part of that change in the master art from late and decaying Classical art in Byzantine, or, as I would rather call it, newborn Gothic art. The first places where it is seen are a few buildings of the early part of the sixth century, when architecture seems to have taken a sudden leap, and, in fact, to have passed from death to new birth. As to the construction of patterns, the change was simply this—continuous growth of curved lines took the place of mere contiguity, or of the interlacement of straight lines. All the recurring patterns of the ancient and classical world were, I repeat, founded on the diaper square or round. All their borders or friezes were formed either by tufts of flowers growing side by side, with their tendrils sometimes touching or interlacing, or by scrolls wherein there was no continuous growth, but only a masking of the repeat by some spreading member of the pattern. But when young Gothic took the place of old Classic, the change was marked in pattern-designing by the universal acceptance of continuous growth as a necessity of borders and friezes; and in square pattern-work, as I should call it, this growth was the general rule in all the more important designs.

Of this square continuous pattern-work there are two principal forms of construction. 1. The branch formed on a diagonal line, and (2) the net framed on variously-proportioned diamonds. These main constructions were, as time went on, varied in all sorts of ways, more or less beautiful and ingenious; and they are of course only bounding or leading lines, and are to be filled up in all sorts of ways. Nay, sometimes these leading lines are not drawn, and we have left us a sort of powdering in the devices which fill up the spaces between the imaginary lines. Our Sicilian pattern of the 13th century gives us an example of this; and this Italian one of the fourteenth century gives us another of the leading lines of the diagonal branch being broken, and so leaving a powdering on those lines; but in all cases the net or branch lines—that is, the simple diagonal or crossing diagonal—are really there.

For clearness sake, I will run through the different kinds of construction that I have named:—1. Horizontal stripes; 2. Block diaper or chequer; 3. Matting diaper (very various in form); 4. Square line diaper; 5. Floriated square diaper; 6. Round diaper formed by contiguous circles; 7. The diagonal branch; 8 The next; 9. (which is supplementary) powdering on the lines of the diagonal branch, or of the net. These are all the elementary forms of construction for a recurring pattern, but of course there may be many varieties of each of them. Elaborate patterns may be wrought on the stripes or chequers; the foliated diaper may be wrought interlocking; the net may be complicated by net within net; the diagonal bough may be crossed variously, or the alternate boughs may be slipped down so as to form a kind of untied and dislocated net; the circles may intersect each other instead of touching, or polygonal figures may be built on them, as in the strange star patterns which are the differentia of Arab art. Of course, also, these constructional lines may be masked in an infinite number of ways, and in certain periods it was most usual to do this, and much ingenuity was spent, and not a little wasted in doing it.

Before I pass to the use to which these forms of pattern may be put, I will say a little on the subject of the relief of patterns, which may be considered as the other side of their mechanism. We have, you see, been talking about the skeletons of them, and those skeletons must be clothed with flesh—that is, their members must have tangible superficial area; and by the word relief I understand the method of bringing this out. Of course, this part of the subject is intimately connected with the colour of designs, but of that I shall only say so much as is necessary for dealing with their relief.

To put the matter as shortly as possible, one may say that there are two ways of relief for a recurring surface pattern—either that the figure shall show light upon a dark, or dark upon a light ground; or that the whole pattern, member by member, should be outlined by a line of colour which both serves to relieve it from its ground, which is not necessarily either lighter or darker than the figure, and also prevents the colour from being inharmonious or hard.

Now, to speak broadly, the first of these methods of relief is used by those who are chiefly thinking about form, the second by those whose minds are most set on colour; and you will easily see, if you come to think of it, how widely different the two methods are. Those who have been used to the first method of dark upon light, or light upon dark, often get confused and troubled when they have to deal with many colours, and wonder why it is that, in spite of all their attempts at refinement of colour, their designs still look wrong. The fact is, that when you are making up your design by contrast of hues and variety of shades, you must use the bounding line to some extent, if not through and through. Of these two methods of relief, you must think of the first as being the relief of one plane from another; in it there is always an idea, at least, of more than one plane of

* Part of a Lecture delivered by Mr. William Morris.

surface, and often of several planes. The second you must think of as the relief of colour from colour, and designs treated thus both should look, and do look, perfectly flat. Again, to speak broadly, the first method is that of the West, the second that of the East; but of the latter and (excuse the "bull") the Gothic East, the idea of plane relieved on plane was always present in all the patterns of the ancient and classical world.

(To be continued)

A New Imitation Sealskin.

A new and curious branch of silk manufacture has lately crept into some Paterson, N. J., factories. The process is a secret, and no information can be given about it, as every safeguard is maintained to prevent its getting out. The weavers themselves possess the secret, which is not even imparted to their employers, and they work in a small room closely locked on the inside and out, so that no one can see how the curious loom is worked. The work is said to require great skill and only a few weavers can do it, who consequently can demand and receive very large wages. Whether the thing is a success or not remains to be seen, as none of the goods have yet been placed in the market. Some of the samples that have been exhibited, however, are said to have created a decided sensation. The goods produced are nothing more nor less than imitation sealskin, made of silk! It is a new process, and entirely different from the manufacture of velvet, or plush, or anything of that sort, and the product is said to so closely resemble genuine sealskin of the finest quality as to deceive even experts. It is quite expensive, although of course nothing to be compared with real sealskin. The future of this branch of the silk trade remains to be seen. If the product is really what it is represented to be, it is a big thing, and will doubtless prove exceedingly profitable to those possessed of the secret of its manufacture.—*N. Y. Fancy Goods Record.*

The Manufacture of Gold Thread.

(Continued from Page 52.)

The means employed to produce these results are peculiarly interesting. In the first place slabs or "cakes" of pure silver, weighing each about a thousand troy ounces, are obtained from the Bank of England. These, after coming to the mill, are alloyed with about nine or ten per cent. of copper, not for the sake of adulteration, but to make the metal sufficiently tough to undergo the process of drawing. This admixture of copper in the silver is also said to produce an effect on the gold with which it is afterwards overlaid, making the tint somewhat richer than it would be if pure silver were employed. The silver, thus alloyed, is cast into cylindrical ingots, or bars, about two feet in length by two inches in diameter, and weighing some four hundred ounces. Each bar is then well hammered at a dull red heat to give it further toughness. Being thus made full of hammer marks, the bar is drawn through holes in steel plates in order to make the surface somewhat smooth. After that it is scraped with a tool, filed, and rubbed, the entire process removing something like fourteen ounces of metal. The silver bar is now about three and a half feet in length, or nearly double what it was before, and of course is proportionately thinner, a result due to the powerful stretching it received in passing through the steel plate. At this stage the gold comes upon the scene. This metal arrives at the mill in the form of leaves, but of much stouter substance than that which is employed in gilding wood. The metal is absolutely pure and very soft. With due precautions, so that no grease or moisture shall interpose, the gold leaf is laid upon the silver bar, and leaf upon leaf until the requisite thickness is obtained. The gold adheres to the silver with singular readiness, and so also the gold leaves at once attach themselves to each other under the simple pressure given by the bar as it rolls over on the leaves. So quick is the adhesion that if one leaf too many gets laid upon the roll the mistake is past remedy, except by scraping all off and beginning again. The gold thus laid upon the silver generally bears to the latter a proportion of about 2 per cent. Paper is now wound round the bar, so as to entirely cover the metal, and this is tied up with string, in which state the whole affair is thrust into a fire of charcoal, where it remains until the cross section at the end of the bar is seen to be of a dull red heat. It is then taken out and fixed between two "standards," resembling vices in their action. Thus firmly held, the bar is well rubbed with burnishers, and finally it is ready to be drawn into wire.

The gold which now covers the bar or rod maintains its external position to whatever degree of fineness the wire is afterwards drawn. Lubrication is employed throughout, in the form of bees-wax, and great care has to be exercised that there shall be no abrasion of the gold. But with skill and proper appliances the gold remains uninjured. At first considerable force has to be employed, and the operation rather resembles rope-making than the production of an article which may enter into the structure of a muslin scarf. The illusion is rendered almost perfect when a couple of sturdy workmen exert their strength to wind the golden strand round a wooden windlass. It seems rough treatment for precious metals, but the subsequent stages are more delicate. We may trace the bar from its cable-like condition through the various degrees of fineness imposed upon it as it passes through plates finer and yet finer in their proportions, until steel will no longer answer the purpose, and perforated rubies, sapphires, and diamonds have to be employed. The bar, two inches thick and two feet in length, thus becomes a wire so fine in its structure that every ounce of its weight is drawn out to a length of thirteen hundred yards, or from that up to two thousand five hundred yards. Still it is "gold wire," for the silver is thoroughly encompassed by the gold. The number of holes passed through in the various gradations will be from one hundred to one hundred and fifty, and the loss of metal will not be more than from six to eight grains per troy pound. Gold wire has been drawn at the mill to the fineness of five thousand yards per ounce troy, or finer than human hair. It is possible to attenuate gold to a much greater degree than this, but it is not easy to obtain a correctly circular aperture through which to draw it. It may take a fortnight to produce a fine and true aperture in a diamond. At the request of a provincial astronomer an attempt was once made to produce an excessively fine gold wire, to be used in a transit instrument. In this case there was no silver core, but a wire of pure gold was inserted in a tube of copper. The solid cylinder or rod thus formed was then drawn to a great degree of fineness, and the copper afterwards dissolved off from the gold by means of nitre acid. The fine filament of gold thus obtained was reckoned at twelve thousand yards to the troy ounce. This was then placed in another copper tube, and the process of squeezing and dissolving was repeated. How far the experiment went it was difficult to tell, but it was reckoned that the wire ran at least twenty thousand yards per ounce. But the ghost of a wire began to fall to pieces, and the astronomer decided to adhere to the usual appliance, that of a thread from the spider's web.

Silver wire is drawn as well as gold, and in either case the wire is seldom used in its rounded form, except for epaulettes and some special decorations. The flattening of the wire is usually effected by means of steel rollers. The apparatus employed for this purpose requires to be remarkably perfect. Some of the best "flatting mills," as they are styled, though they are somewhat tiny machines, have been made by Herr Krupp, at Essen, and it is said that none are made in England. The flattened gold wire is subsequently twisted round silk by means of what are called "spinning engines," of which there are many in the mill, and water power is said to be specially suitable for this purpose, owing to its very regular action. The gold thread thus manufactured generally runs five hundred yards per troy ounce. A finer gold thread is obtained with greater facility and economy by an electro-plating process. For the India market gold thread is produced with the fineness of a thousand yards to the ounce. The thread, after reaching India, is worked into shawls, dresses, turbans, and other articles.

This entrance of the English thread into the Indian market is a remarkable fact. Sir George Birdwood, in his official treatise on "The Industrial Arts of India," states that there is an immense manufacture all over India, and particularly in the old royal cities, of gold and silver wire and thread, as well as gold lace, gold and silver foil, and spangles. He asserts that "the natives of India are far superior to the Europeans in the art of wire drawing." Considering the means they employ, the natives of India, doubtless show consummate skill in this mechanical process, but we doubt whether they produce results which can vie with some of those we have described. It is mentioned as a proof of their skill that the wire-drawers of Bombay can produce nearly eight hundred yards of wire from two shillings worth of silver. But we have seen silver drawn to more than twice this degree of fineness. At the same time the Indian artisans are very astute at their work, and withal, are very patient and painstaking. They quite understand the advantage of flattening the wire, and for this purpose they simply beat the round wire flat by manual power, utterly regardless of Herr Krupp's delicate machines. The Indian method of making gold thread closely resembles the European mode, except that it is rendered extremely tedious by the absence of machinery. But the art, practised in any form, is singularly beautiful, and the natives of India have turned it to the best account in the production of magnificent articles of attire, the rich brocades, stiff with gold, and resplendant with shining dyes, while, richer still, we have the *Soneri*, or "golden" stuff, absolutely cloth of gold. *Ruperi* is in like manner formed of silver, and probably, as Sir G. Birdwood suggests, is the kind of fabric in which Herod made the last display of his magnificence. Concerning gold, we may go back to yet remoter times, when concerning "the king's daughter," it was said, "her raiment is of wrought gold;" and when Homer described the golden net of Hephæstus as being "fine as the filmy webs the spider weaves."

Textile Manufacturing on the Pacific Coast.

"Our San Francisco correspondent recently referred to the large winter demand for local woollen goods in that city, and to the inability of the mills to fill orders. The extent of this industry west of the Rocky Mountains is not generally known. The following statistics of the woollen mills are reliable. California: 71 sets of cards; or 22,600 spindles; employs about 1,338 Whites and 725 Chinese. Oregon: 14 sets of cards, or 4,480 spindles; employs about 275 Whites and 70 Chinese. Utah: 5 sets of cards, or 1,500 spindles: employs abont 100 Whites. This gives a total of 90 sets of cards, or 27,580 spindles, employing an aggregate of 1 713 White operatives and 795 Chinamen. This machinery and help produce on the Pacific slope about 19,200 pounds of woollen goods daily, or 4,860,000 pounds annually. The product of these mills consist of flannels, blankets, cassimeres, shawls, horse clothing, &c. No dress stuffs or feminine wear are manufactured. The raw material nsed in woollen manufactories on the Pacific slope is about 10,935,000 pounds yearly, consisting of wool in grease, cotton, and other material for mixing. Excluding blankets used in gold and silver mining, ice blankets, horse clothing, ship supplies and export, it is estimated that the population of the states and territories of the Pacific coast, namely, California. Nevada, Oregon, Washington, Arizona and Utah, consume yearly abont 13,500,000 pounds of woollen goods, such as the Pacific slope mills produce. This leaves a very wide margin for expansion, and would indicate plainly that there is no danger for quite a long time to come, of any reduction in prices through local competition The raw material of manufacture is on the spot, and, in brief, woollen manufacture is as favourably conditioned on the Pacific slope as cotton manufacture in the sonth. The wages fund averages per set, for one month, $500, or $540,000 yearly for the 90 sets in operation. Freight east for California is 1½ c. per pound for wool in grease up to 12 c. value, and 2 c. per pound for scoured and higher priced staple. This is a very decided advantage to the local manufacturers."—*Bradstreet.*

A New Silk-Coated Fabric.

A statement comes from the Continent that a process has lately been perfected by which threads can be coated with a solution of silk, and afterwards worked up into fabrics of great beauty. A solution of waste silk in its fibrous condition is obtained by the action of pure caustic soda, to which a certain quantity of good tallow is added. The fabric which is to undergo the process is plunged into a bath containing the above, and after subsequent drying and (in some cases) calendering has taken place, the effect produced is said to be exceptionally good. Tissues which have undergone the operation can also be bleached. It is stated that the process is not only available for giving a silky appearance to inferior tissues, but can be used for the purpose of improving the effect of a low class of silk by precipitating upon it a solution of a superior quality. The process can be applied to wool, as vegetable fibres can be treated in a similar way with the result of producing a woollen appearance. The value of this discovery, we are told, lies in a great measure in the opportunity of using fibres which have been hitherto only partially employed for manufacturing purposes. When baths of silk and wool have been both applied to inferior fabrics, it is said that striking effects are produced, which may be compared to the application of a velvety surface to silk or to the embellishment of a surface of velvet with a silky finish. Effects of a novel character are also to be obtained by using a single bath composed of a mixture of the two substances.

SCIENTIFIC AND ART NOTES.

The Lisbon Arts Exhibition is very successful, and the objects sent from the South Kensington Museum are much admired.

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The recent National Exposition at Milan, realised a profit of 565,000f. the outlay having been 3,250,000f., and the receipts 3,815,000f.

* * * *

The Royal Albert Hall Exhibition for 1882 is being organised, and will open in May. The arrangements for the reception of pictures crowded out from the R.A. will be the same as last year.

* * * *

A manufacturer in the Isle of Man is carrying on business in woollen goods upon Ruskin principles. He eschews steam power, and employs the old women of the island to work by hand. He also eschews adulteration.

* * * *

The sales at the Exhibition of the Royal Institution, Manchester, have been upwards of £6,000 to date of closing. This is more by one-third than in 1880. Amongst the pictures sold was Mr. Henry Moore's "Mid Channel" for £600.

* * * *

The Art Union held in Manchester in aid of the building fund of the new School of art, has resulted in a profit of abont £4,000. This amount does not quite clear the debt, but it is certain that the sum now required will be forthcoming from friends of the school.

* * * *

A banquet in a steam boiler was lately given by a German manufacturer in the Duchy of Baden to celebrate the completion of one of the largest steam boilers in the world. Inside the boiler a scaffolding was erected, containing a table for thirty guests, while racks for the cookery and wines were arranged along the sides. The only defect was the entrance, as the guests had to slip in through a three-feet opening in the lid.

* * * *

Sir Philip Cunliffe Owen, in presenting prizes on Thursday to students at the Derby Central School of Art, announced that Mr. M. T. Bass, M.P. for Derby, had expressed his intention of supplementing his recent gift to the town of a museum and library, costing £25,000 by giving £3,000 for the erection of an art gallery; and that the Mayor of Derby (Mr. Woodiwiss) had agreed to give a piece of land, worth £1,500, at the rear of the library.

* * * *

A chemist, M. Windeuran, has succeeded in tinning linen, cotton, or paper fabrics by the following process:—A pound of zinc powder with a solution of albumen; then he spreads the mixture on the stuff by means of a brush. After drying, he fixes the layer by passing the cloth through dry, steam, in order to coagulate the albumen. He then passes the stuff or paper through a solution of chloride of tin. The metallic tin is reduced to an extremely thin coating on the zinc. The cloth is then washed, dried, and rolled.

ORIGINAL DESIGNS.

Our first plate is a design well adapted for a Kidderminster or Scotch carpet to be coloured as follows:—The ground Pale Sage Green; the leaves a Warm Brown; the sprays of flowers a Pale Blue; the single flowers Maroon; the band dividing body and border Brown; the border-ground Maroon; the leaves Sage Green, and the flowers Pale Blue. This design is drawn by Mr. R. Lord.

* * * *

The second design is from the pencil of Mr. E. Hoyle, Sedgefield Terrace, Bradford, and should be of service as a suggestion to manufacturers of Linen Damask Table-covers.

* * * *

Our third plate is a design suitable for a Cretonne, which gives great scope for good colouring.

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*** We beg to inform manufacturers and others that adaptations of designs, published in the "Journal of Fabrics," can be made at the Office by experienced Designers, and that Original Designs can also be furnished at moderate charges.

MONTHLY TRADE REPORTS.

Wool—Trade on the whole during the month has been of a very dragging character. In London a slight reduction in values has taken place with a restricted business. At the Liverpool sales which closed on the 3rd inst., 10,750 bales were catalogued and only about 2,300 bales found buyers. A few lots made good prices, but the average showed a decline on the November sales. In the Scotch trade no movement of any consequence has been made. Users seems to buy only what is required from week to week. Prices have not been much affected by the quietness which has prevailed. At the sales at Edinburgh on the 17th to 19th ult., only a small business was done—the bulk of the wool being withdrawn. In Bradford business has been very quiet, the quantities disposed of being insignificant, but without much alteration in prices. Sellers are unwilling to accept lower rates, owing to the fact that they are unable to replace stocks at less prices. In Halifax a slackness of demand has had its influence in slightly depressing prices, but it is only slightly, as staplers believe that spinners must become more general purchasers soon. In the yarn trade a weakness in prices has been perceptible for export, which extended slightly to the home trade at the end of the month, still spinners have made but slight concessions, as they are pretty well employed on old contracts, and prefer to wait a short time before taking new contracts at any reduction.

Cotton.—The month opened with a fair amount of enquiry in most departments of the market, and in some considerable sales were effected. The prices offered however prevented many from selling, and as a rule large orders were few. Towards the middle of the month quotations for the raw material advanced, but without much benefit to the manufactured articles. In the yarn and goods trade, excepting a few days at the beginning of the month, the whole period has been marked by inactivity, and by a flatness of tone. India and China merchants have shown a disinclination to give out orders. Stocks are not at present large, but yet contracts have been much reduced, and in many cases entirely worked out, without any fresh orders coming in. On the whole the market is in rather an unsatisfactory condition.

Woollen.—This trade in its satisfactory nature is a great contrast to that of the cotton. During the whole of the month it has been marked by a fair state of activity. Stocks are much lighter than they were in December, owing to the weather infusing a little life into the retail department. Spring orders continue to come in with great steadiness in the Leeds district. The home trade is good, and export houses are fairly occupied. In Huddersfield business is very satisfactory in every department. At Batley a good turnover has characterised the market, with a prospect of a very good season, both on home and export account. Manufacturers are buying wools at current rates, without any attempts at a reduction, as they have no expectation of a decline in values at the next London Sales.

Silk.—Early in the month a fair business was done, but this feature died away as the month advanced, and a very quiet feeling prevades at present. Manufacturers complain much of the absence of demand for their goods, buyers holding off in the expectation of finding bargains in Lyons. In Japan silk business has been done at a reduction of 1s. per lb. In China silk prices are also weaker.

Linen.—Trade has presented a fair degree of steadiness during the whole month. Orders for home have been given out at fairly remunerative price; but for foreign account orders come in slowly. Prices are on the whole firm.

Carpets—The past month has been a busy one for the trade. Orders have come in freely and at fairly remunerative rates, with the exception of the tapestry department. This seems to be at present an unprofitable part of the trade. In the Brussels branch, manufacturers are assured of work for some months to come and, providing there is no great rise in the wool market, this branch may be said to have a satisfactory prospect before it. There is a very hopeful feeling in the market.

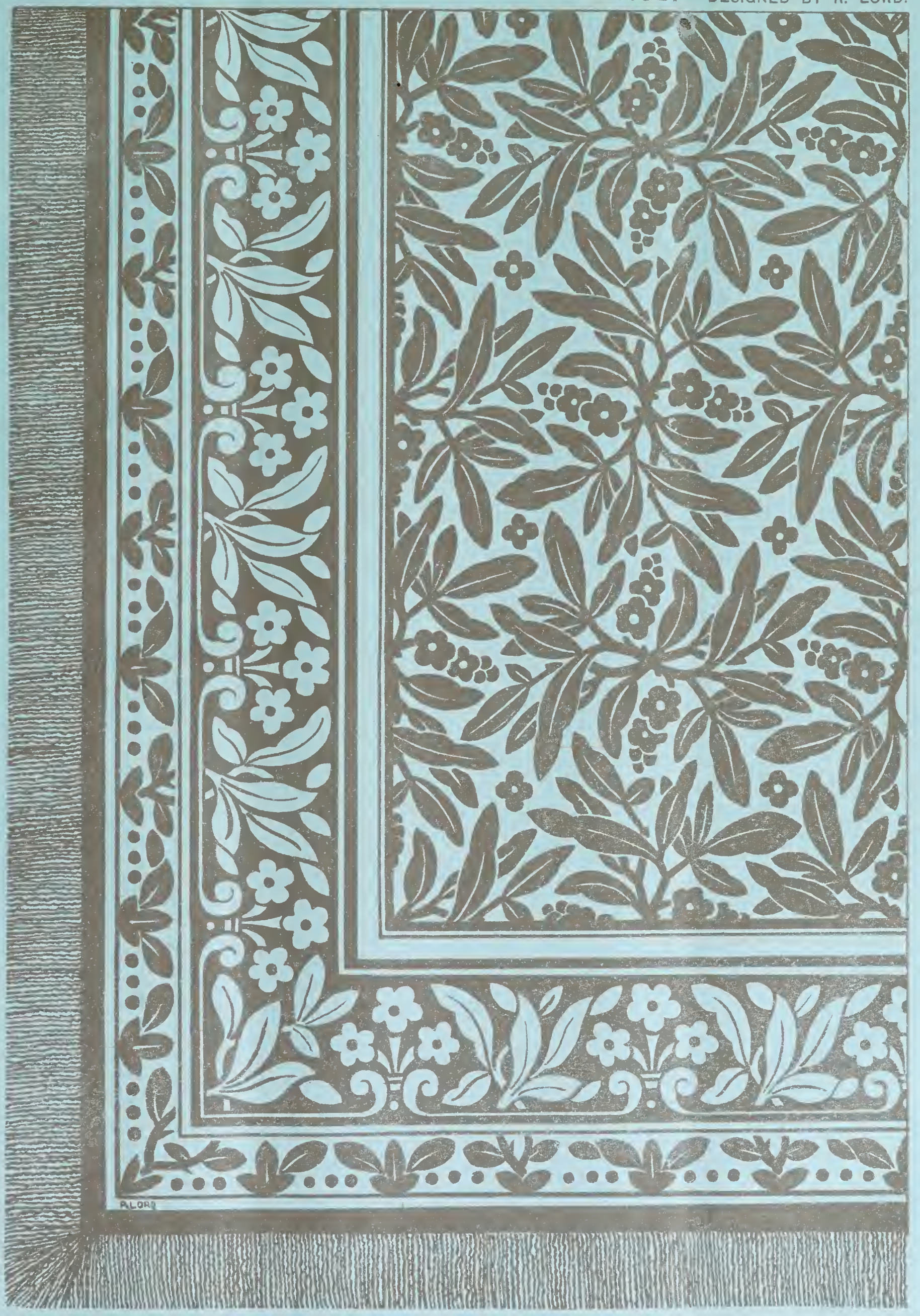
Lace.—The market has been fairly active, with prices having a slight tendency to rise. The home trade has been good in all departments, and as a rule manufacturers have refused to produce goods upon which they cannot realise an adequate profit. For export a fair demand has been experienced at full rates, notwithstanding the competition abroad. The sales during the past year have been far in excess of any previous year, and the quantity produced is constantly increasing. The trade is on the whole in a very satisfactory condition.

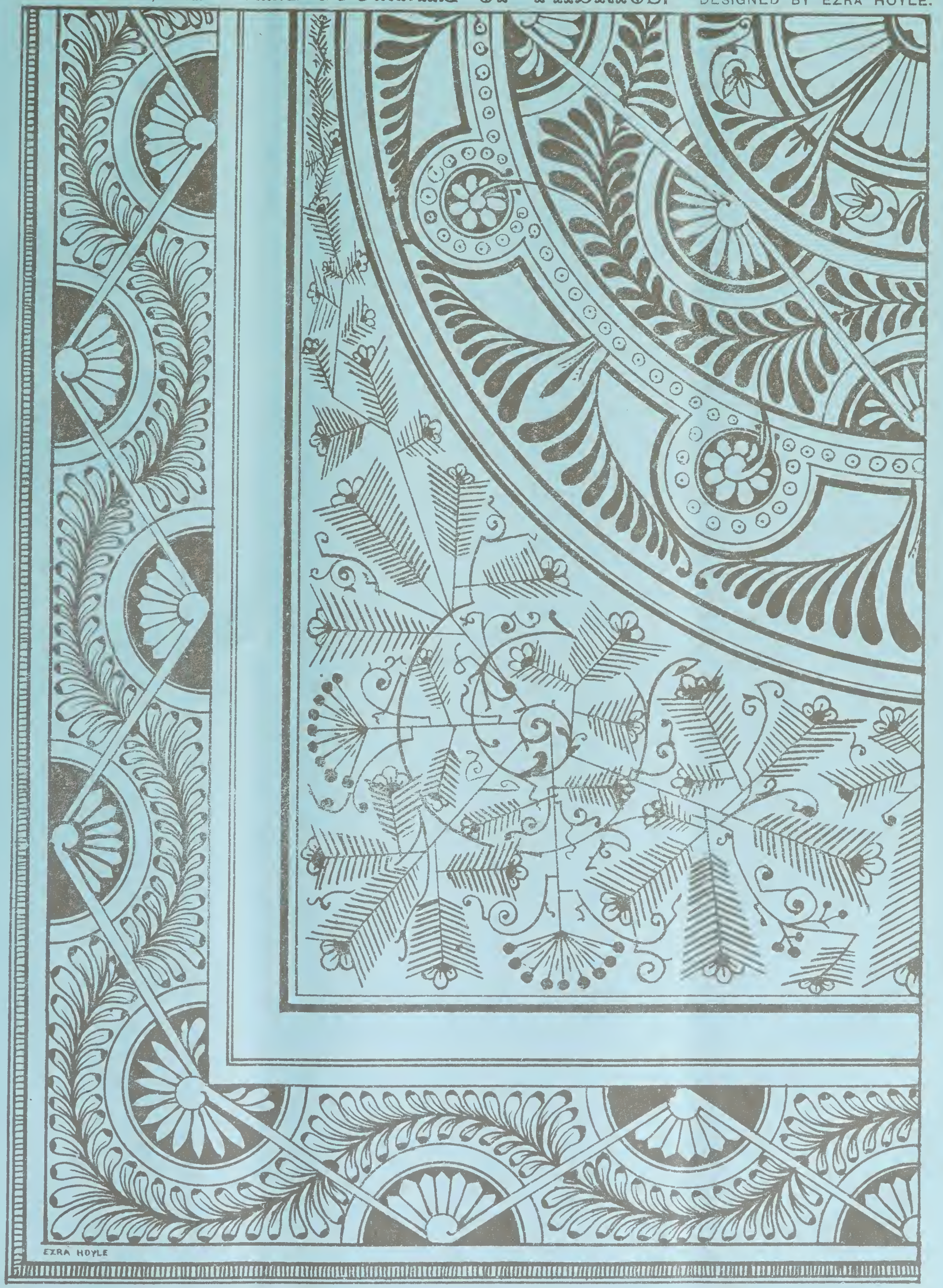
The Soap Tree.

Our Antipodean colonies ought certainly to act upon the advice tendered to them by Baron Ferdinand von Müller, by experimenting with the cultivation of the *Quillaja saponaria*, or soap-yielding tree. It is affirmed by the *Colonies and India* that the tree is fast disappearing from the forests of Chili, its chief *habitat*, owing to the recklessness with which the natives strip off the bark, which contains the saponaceous element. Our contemporary asserts that for dressing silk and wool, chemical science has not yet discovered any equally efficient substitute for this bark, and it has accordingly come into large demand both in France and England. But Australia and New Zealand, being great wool-producing countries, are even more interested in procuring a supply of such a powerful alkaloid; and as the climate in some parts of these British colonies must be somewhat similar to that of Chili there seems no reason why the *quillaja* should not become acclimatised out there. This would be a grateful return on the part of the outside world for the obligation conferred upon it by the transplanation of the Australian *eucalyptus*, with its wonderful facualty for rendering miasmatic localities healthy. Perhaps the *quillaja* might also be established in India. Every variety of climate and of soil can be found there, while the indigenous silk manufacture would be greatly benefited by a supply of a cheap and powerful cleansing material.

The Calico Printers' Ball, at the Town Hall, Manchester, on the 25th ult., passed off very successfully. The ladies especially carried out the idea of the promoters, even more than was anticipated. They wore costumes composed entirely of British printed cottons, and in addition had mantles and wraps of the same materials. These were tastefully designed, sometimes showing on each side different colours which harmonised with the general appearance of the dress. All classes of printing represented at the ball were really of the first rank as regards design and workmanship, and were examples of the latest efforts of the British calico printers.

DESIGNED BY R. LORD.

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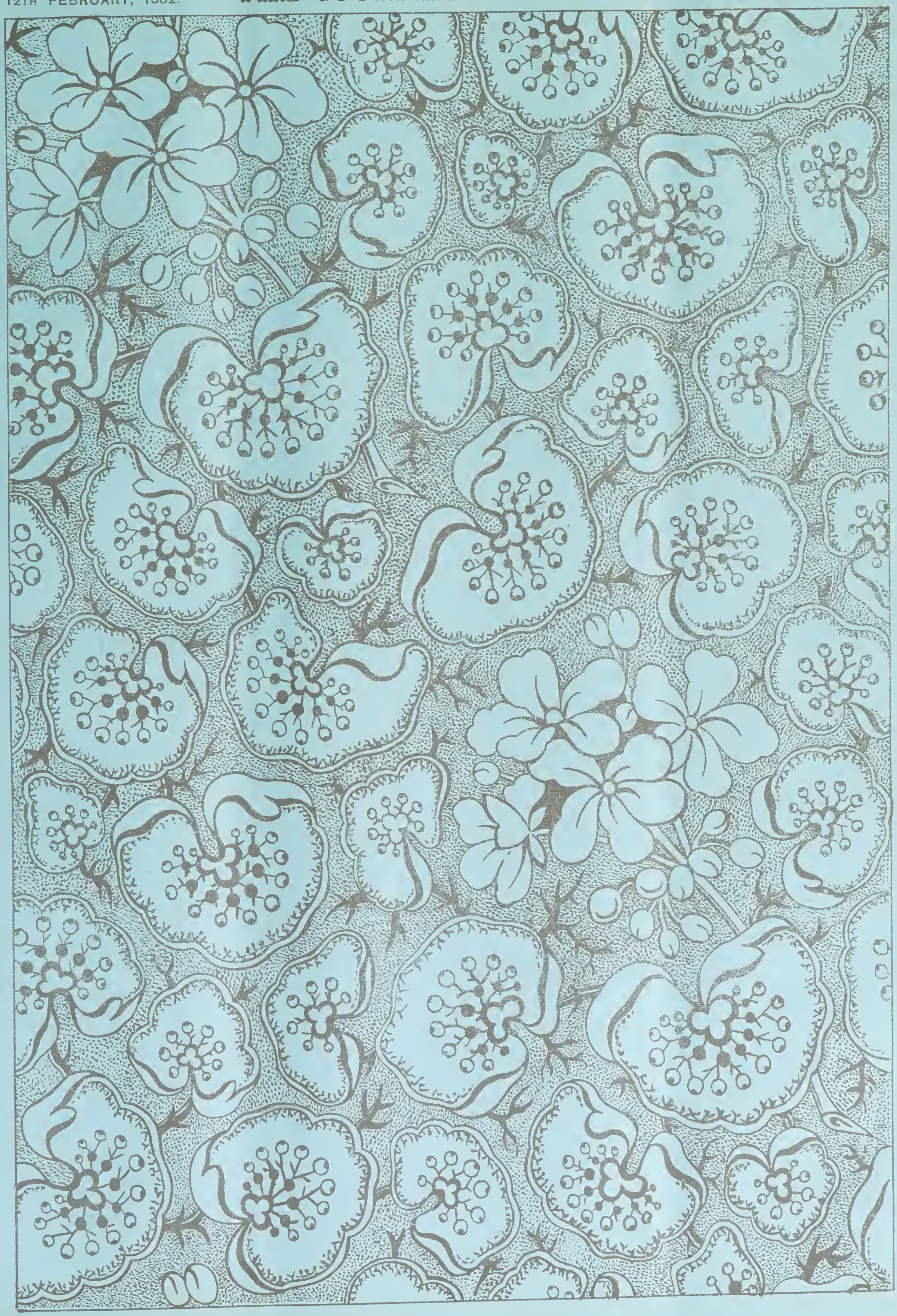


The Industrial Resources of Ireland.

In a paper read recently before the Society of Arts by G. Phillips Bevan, F.G S., on the "Industrial Resources of Ireland," a great deal of useful information, that told mostly of decreasing prosperity, and of the decay of many industries, was given. The reader, after referring to coal, iron, copper, and other like trades, spoke particularly of the textile industries. "The flax and linen trades of Ireland," said he "have a world-wide reputation, which sufficiently disposed of the accusation so often brought against the Irish people, that they had not the capabilities for becoming a manufacturing race." The statistics of the linen trade, although bearing the stamp of a well-rooted and important national industry, have some points about them which are not altogether so satisfactory as might be, and particularly at the very outset of the trade, viz, the growth of flax, which so nearly touches the prosperity of the farmer as well as the manufacturer. The mistake has often been committed in Ireland of attempting to grow flax on a soil not suitable for the crop, and Mr. Charley, an eminent Belfast authority, mentions that he saw in county Roscommon a soil consisting of a thin clay prepared for flax, with the result, that from 40 to 50 acres a produce was obtained, not exceeding what should have been obtained from 3 or 4 acres of good land. The reason why flax is so successful in county Down, where there were 31,456 acres in 1880, is because the soil consists of a light loam, admirably suited for flax. Geologically, the soils that compose the counties of Down, Antrim, Armagh, Monaghan, Londonderry, Tyrone, and Donegal, consist of lower Silurian, with the igneous rocks associated with them. One may reasonably enquire, therefore, why the same formations in other counties are not more experimented upon for flax growing. If the soils of Tyrone (and this is largely a question of geological chemistry) can grow 24,268 acres of flax, why should Wicklow and Wexford, which consists mainly of the same formation, grow only one acre between them? Of course there may be other reasons which may bar the flax growth, though I am not aware of any; but looking at the question as one largely of soil, it is not unreasonable to suppose that a minute examination of the rocks and soils of the country would greatly tend to the increase of the home flax, and what is more, to the extension of the linen trade from Ulster, to Leinster, Munster, and Connaught. That the limitation of flax growing and manipulation to Ulster is not due to any physical cause, is evident from a sentence which I have extracted from the "Instructions for the Culture and Preparation of Flax in Ireland," issued by the Flax Supply Association:—"One consideration which should inspire the southern farmers with self-confidence, and stimulate them to grow flax, is the advantages possessed by them of soil and climate, which will enable them to produce crops larger in yield, and at a less cost, than is done in the north of Ireland." From the statistics of the factory returns, we find that, while in 1871 there were 154 linen factories, these had decreased in 1879 to 144, principally at the expense of the spinning factories, though those for weaving had increased. As regards the machinery, while the spinning spindles in 1881 show a not very large increase since 1871 (the numbers being 879,835 to 866,482), the doubling spindles have considerably decreased (16,194 to 20,166); while, on the other hand, the power-looms have largely increased, being 21,177 to 14,834. In the preparatory machinery, viz., the scutching mills, by which the flax is got ready for spinning, there is a decided decrease, being 1,199 in 1879, against 1,542 in 1869. In the interests of the trade, it is perhaps as well that this decrease should take place, as the gross produce of the plant is lessened by mill-scutching; while hand-scutching invariably yields more fibre to the acre. Moreover, the reports of the factory inspectors seem to say that the scutching-mills, being in very out-of-the-way country districts, are not very favourable either to cleanliness or morality.

Mr. Bevan next made reference to the Woollen industry, touching briefly on its past history, stating "that as far back as 1360 stuffs called fays, made in Ireland, where in such request on the Continent, that they were imitated by makers in Catalonia, who were in the habit of producing the finest goods; they were also esteemed in Italy and other countries." From that time until the year 1698 when by an arrangement between the English and Irish Parliaments, the latter imposed export duties on their own woollen goods, with the view of buying off English opposition to the linen manufacture the industry continued to thrive; but the arrangement acted very prejudicially on the Irish trade and most certainly did not check the English linen trade. Further export duties were levied on the Irish woollen goods, "thus it was that a trade, for which naturally Ireland possessed all the facilities was thwarted and almost destroyed, though there has been for some years past a tendency towards revival, which deserves the most careful attention at the hands of the Irish landlords and capitalists. Mr. Bevan then gave the following statistics:—In 1878, we find that there were 73 woollen and worsted factories, with 40,393 spindles; and 411 power-looms, against 61 factories in 1871, having 29,108 spindles and 251 power-looms, while of workers there were 20,545 engaged in the trade in 1871, against 15,675 in 1861; 45,137 in 1851; and 78,090 in 1841." Dr. Neilson Hancock spoke in 1865 of the revival of the woollen trade as a hopeful indication, and, "as it is based on the use of Ireland's natural advantages in wool, water-power, and turf (as fuel) the trade admits of a great extension, and may, with the rising price of coal in England, very possibly enter into successful competition with the English manufacturers of Irish wool." The cotton trade never was much of a staple of Ireland, and is now in a less flourishing condition than ever it was. There is nothing indigenous, so to speak, in the circumstances of the manufacture, to which the dampness of the climate is doubtless somewhat unfavourable. The tendency to decrease also appears in the jute manufacture, which, one would have thought, had the same element of success as the linen trade, and yet we find that in 1871 there were five jute factories, and in 1873 only three. True, there are a few more hands employed, viz.: 727 in 1871, and 812 in 1872. Many of the subsidiary textile trades have such an unqualified success in Ireland, as regards character of work, that we can only regret that they are so exceedingly localised. The knit hosiery of Balbriggan, for instance, is known and appreciated all over England; the Irish poplins (a combination of silk and wool) are celebrated throughout the world; while the embroidery on muslin, so largely executed at Bangor and other towns in the district of Ards, county Down, is attaining as high a reputation as the guipure lace of Limerick These manipulative home industries, as they may be called, appear to flourish in their way, better than factory industries (always excepting those of linen): for in searching the pages of an Irish directory, it is disheartening to come across such statements as, "Ballinakill (Queen's County)—woollen trade decayed;" "Palmerston—flax, oil, lead, and iron trades all gone;" "Edenderry—woollen trade disappeared;" "Kilkenny—woollen cloths and blankets, once very flourishing, but now extinct;" "Moate—linen and cotton, all gone;" "Stradbally—cotton trade disappeared;" "Dublin—tape making, employing 6,000 hands, no longer carried on." Migrations of trade have happened and do happen in every country, but in Ireland they do not appear to have been replaced to any extent by others.

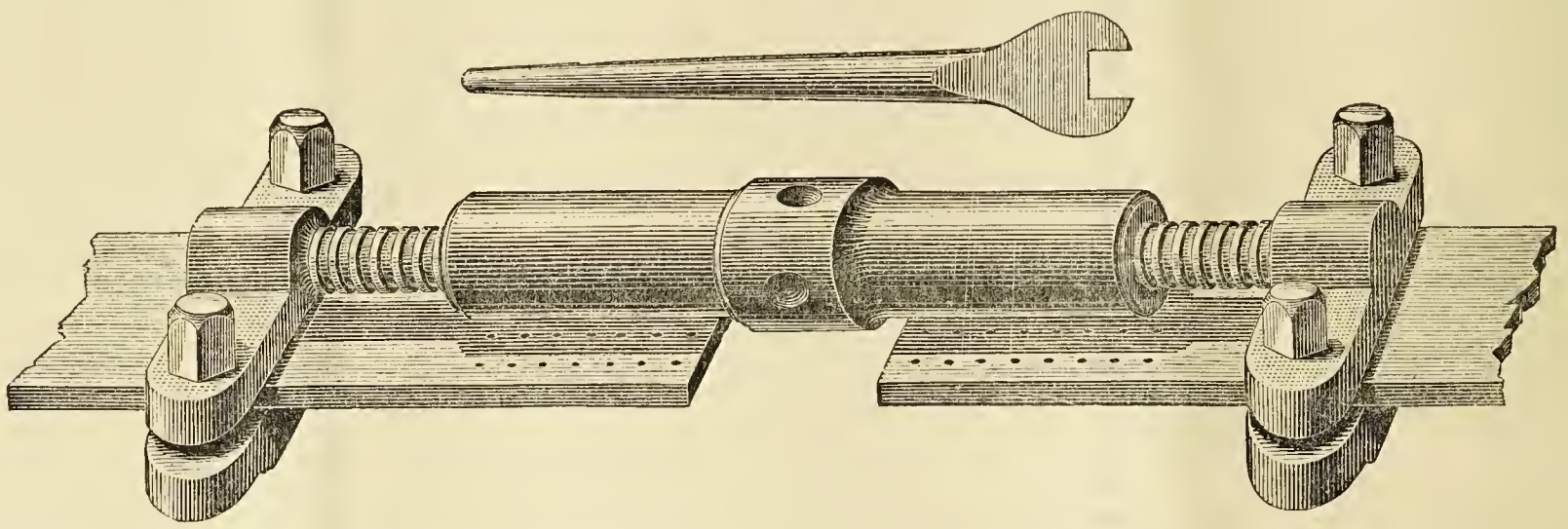
All honour to those landowners who have the foresight to cope with the difficulties, by establishing local industries, such as have been done by Mr. Bloomfield, in Fermanagh, and by Mr. Musgrave, at Garrick, a wild district in Donegal, where a glove-knitting factory is already in active operation, with immediate prospects of a button and power-loom hosiery factory to follow."

The South Kensington Museum will shortly be enriched by a bequest of Mr. John Jones, army contractor, who died at 95, Piccadilly, on the 7th January, leaving to the nation his collection of pictures, china, and bric-a-bric, said to be worth nearly half a million Our foreign contemporary, the *Courrier de l'Art*, however, recommends the South Kensington authorities to exercise caution in accepting this copious legacy. Mr. Jones, it states, was more than once imposed upon, and paid large sums for dexterous imitations.

MACHINERY, TOOLS, ETC.

Moxon's Belt Stretcher.

We have received from Mr. J. Moxon, of Sheffield, a copy of his "Useful Information for Users of Belting." The pamphlet deals with the nature of the materials used in single, double, and main driving belts, their joinings both by means of laces and fasteners, and gives a table of the weight, thickness, and strength of various makes. It also contains some valuable information in reference to the covering of drums, the use of pulleys, and rules for ascertaining the exact length of belts when unable to measure; for calculating the speed of pulleys; and for the horse power of leather belts. Users of belting cannot do better than procure a copy of the work. We give an illustration of Mr. Moxon's "belt stretcher," which is a simple,



handy, strong and cheap tool for quickly tightening large belts upon the drums. By its use the serious injury often sustained to belts through being forced upon the drums, after being taken up in the ordinary way, is entirely avoided, and the risk to life and limb is reduced to a minimum. Any width of belt can be drawn up a distance of 24 inches in half a minute after it is secured to the ends of the belt. This is an important desideratum, as much valuable time is often wasted in taking up or tightening belts. In the case of very wide belts two or more stretchers can be used by placing them together across the belt and working them together. They are made in two sizes, and sold by J. Moxon and Co., 29, Scotland Street, Sheffield, who, we are sure, will furnish full information in reference to them.

Inventors of Spinning and Weaving Machinery.

At Manchester a lecture was recently given by Mr. Alderman W. H. Bailey on "Inventors of Spinning and Weaving Machinery." Mr Bailey said nearly all the inventions in spinning and weaving machinery had been made in places within a few miles of Manchester. It did seem remarkable that Manchester was in the vicinity of the first passenger railway station in the world, of the first steam hammer in the world, which was invented at Patricroft; of the first fly shuttle, which was invented at Bury; of the two first spinning jennies, which were invented at Blackburn and Leigh; and of many other valuable inventions which had had such a great influence upon the prosperity of Englishmen, and had been beneficial to all people who wore clothes and ate bread. Before 1733 spinning in England was done very much in the same manner as it was among the savages, but in that year John Kay, of Bury, invented the fly shuttle, which was so great an improvement that a famine was created in yarn, which was relieved by the invention by James Hargreaves, of Blackburn, and Thomas Hayes, of Leigh, of the spinning jenny. This was in 1767 and 1766. This invention rendered it impossible for the spinners to prepare sufficient yarn to keep the jennies working; and, under these circumstances, Crompton in 1779 invented a hand mule which he brought out in 1780, and which enabled one man to do twenty times as much work as he formerly could. Kay's fly shuttle was now unable to produce yarn sufficiently quickly to feed the hand mules, and shortly afterwards Crompton met the necessity by inventing, in 1785, a patent power loom, which was afterwards greatly improved by various other inventors. The new steam engine of James Watt was now applied to the weaving machines, and it then became imperative that something should be done to enable people to spin at a greater rate. At this stage Richard Roberts, of Manchester, was applied to by the manufacturers to help them out of the difficulty, and he invented the self-acting mule which was even now used with very slight alterations. Besides these men, there was Arkwright, who stole inventions from other people and patented them. None of these men achieved wealth. Hargreaves died in the Nottingham Workhouse; Hayes died very poor in Manchester, and Kay died in France in the greatest possible poverty; in fact, the only man who died rich among the whole lot was Sir Richard Arkwright, who never invented anything. In 1862 a bronze monument was erected at Bolton to the memory of Crompton, and in the lecturer's opinion a similar compliment ought to be paid to the memory of Roberts, who was the most wonderful inventor of the 19th century.

The Importation of Wool.

The Wool Imported into London from Australia, it need hardly be said, does not represent the whole growth of that part of the world, because a considerable quantity goes to America and other ports. It is satisfactory, however, to notice that the importations last year were higher than for the previous four years—the figures being: 1881, 931,887; 1880, 863,816; 1879, 826,357; 1878, 791,102; 1877, 823,783 bales. The whole of the importation for 1881—as, indeed, all other Colonial wool, save one small shipment from the Cape to Liverpool of 661 bales—was received at the Port of London, thus showing that in one way and another there is a large number of people in this city who thrive upon the importation of Australian products. The records of the trade show that the importation of Australian sheep's wool into this country is still largely in excess of the imports from all the other countries put together. Next to Australasia stands the Cape of Good Hope, with 197,047 bales in 1881, against 190,614 in 1880. Other countries the imports of which are classed as "low wools" have imported into Liverpool during 1881, 152,038 bales, against 217,610 in 1880; and it is a notable fact that, though the Argentine Republic is credited with the possession of 90,000,000 sheep, but 4,790 bales were imported into London during 1881, as against 4,700 in 1880, and that but 1,509 bales went to Liverpool in 1881, as against 4,372 in 1880, thus showing that the bulk of the produce from that part of the world goes to Antwerp and Havre, where doubtless it competes indirectly with some of the lower sorts of Colonial wools.

An International Exhibition of Furniture, Drawing, and Printing is to be held in Paris this year, from August 1st to November 15th, under the auspices of M. A. Proust, Minister of the Arts.

The Mayor of Lille has decided that an International Exhibition of Industrial Art shall be held in the Palais Rameau, of that town, from the 15th March to 1st June, 1882. There are to be five classes of exhibits, as follows:—1. Construction: including ornamental stone, wood, and metal work. 2. Furniture: cabinet-making, bronzes, ceramic ware, glass and crystal, painting on glass, decorative painting and mosaic work. 3. Dyed fabrics: including silk, wool, cotton, hemp, jute, linen, paper, leather, lace embroidery, binding, cordwainery, and damasked cloths. 4. Goldsmith's work and jewellery: including electro-metallurgery, art castings, gilding, silvering, and enamelling. 5. Various: engraving, printing, photography, scholastic objects, the original works of artists, compositions for serving as models in industry, &c. Further information may be obtained from the Organising Committee, at the Hôtel de Ville, Lille, France.

The Fair at Leipsic.

From the opening of the Leipsic fair business in textiles was very animated, the fine dry weather having induced a large assemblage of buyers from all parts of Germany to travel to the fair in order to lay in stocks of spring goods, and many manufacturers were so pressed with orders from patterns alone that they have not deemed it needful to bring any stocks. The Lusatian cloth industry is in a very flourishing condition, and although the Cottbus and Peitz manufacturers brought but small stocks with them, they very readily disposed of them. Large purchases have been made on South German account, principally of English designs. From Spremberg large stocks were brought to the market; but although the Leipsic fair usually affords a very good outlet for these products, the buyers at the commencement showed great hesitation, in anticipation of lower prices; but the demand rapidly increased, and stocks are now much reduced. Crimmischau and Werdan goods were readily sold at last year's prices Diagonals from Luckenwalde were much admired, being equal to the finest French products, and met with a considerable demand. In short, with few exceptions, business was very brisk all around, and dealers generally expressed great satisfaction with the results achieved.

ODDS AND ENDS.

The authorities at Turin have decided to follow the example of Milan and to hold an exhibition in the course of the present year.

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The Board of Trade has, it is stated, approved the plans of the new Tay Bridge, and the works will be proceeded with forthwith.

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The net exports from Elbeuf during the year 1881 were 5,231,042 kilos., as against 5,541,937 kilos. in 1880, showing a reduction of 310,895 kilos.

* * * *

Messrs. Barbour and Sons, Hilden Mills, Lisburn, Ireland, use about seventy-five tons of flax, chiefly Irish, per week, in the manufacture of sewing threads, and they export a like quantity for the same purpose to supply their mills at Paterson, state of New Jersey.

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The Parliamentary Committee on Colonial Industries in New Zealand recommends that a bonus should be offered with a view to ascertain the price at which cotton can be grown, and the suitableness of the soil and climate of the northern parts of the colony for its production.

* * * *

It has been decided to sink another shaft in connection with the Channel Tunnel experiments some distance eastward of the present one at Shakespeare's Cliff. and arrangements have already been made to carry out the work, the object being to provide an additional outlet for the *debris* from the boring.

* * * *

The Lyons Société des Sciences Industrielles has decided to offer a prize of £20 and a gold medal of equal value for the best essay on silk weaving. The essays must be written in French, and forwarded to the office of the society by October 1st in the current year. The adjudication will be made early next year.

* * * *

In Belgium the imports of woollen yarns in 1881 show an increase of 318,000f. over 1880, and wools an increase of 19,957,000f. The exports of wool showed an increase of 4,763,000f. over 1880; light woollens show an increase of 1,037,000f.; heavy woollens show little alteration, and the exports of yarns indicate a decrease of 6,438,000f.

* * * *

The Council of the Royal Colonial Institute has decided to seek an interview with the Secretary of State for Foreign Affairs in order to make a representation respecting the French movements in the Pacific. It is alleged that the captain of a French man-of war has taken possession of an island situate in the line of navigation between Panama and our Australian colonies.

* * * *

The Right Hon. Joseph Chamberlain made the following remarks, on the Amendment of the Patent-law, in a late speech at Birmingham:—"I have pledged myself to bring in a Bill on that subject during the next Session, and I am like Mr. James Lowther, I have a Bill in a box; and it is a Bill which would at all events immensely facilitate the process of applying for a patent, and reduce considerably the first cost of obtaining a patent; and under those circumstances it would, I am convinced, stimulate invention, promote industry, and above all, it would enable the poor inventor to test the value of his ideas, and to get the advantage of his ingenuity, of which, unfortunately, his poverty too often deprives him."

The Grünberg Chamber of Commerce, to which Prince Bismarck recently wrote in severe terms with respect to their annual trade report for the year 1880, have replied in a document, which very conclusively shows that although certain branches of trade in their district may have been favourably influenced by the increased tariff, such as the manufacture of tweeds and union cloths, in the majority of cases the tariff has had a very unfavourable influence.

* * * *

The Russian receipts of import duties during the past few years have increased enormously. To illustrate the rapidity of the advances since the late war, we append the following figures:—

	Roubles.		Roubles.
1877	47,353,876	1879	93,456,160
1878	86,995,299	1880	103,237,510

The figures for 1881 are not yet published, but they are likely to show a still further increase.

* * * *

It is a question whether the great reduction in the price of cotton in the past ten years has not displaced a large amount of linen and woollen fabrics, just as linen and woollen fabrics displaced cotton goods when cotton rose to such a high price during the American Civil War. A large part of the loss of trade in linen goods is due to political and financial troubles in the South American States and in the West Indies, which countries used to be amongst our best customers for linens.

* * * *

The production of iron in the Clyde district during the year ending at Christmas, was 127,000 tons over that of the previous year, The exports, on the other hand show, a decrease of 93,000 tons, while the home consumption has increased only 13,000 tons, making a net increase of only 80,000 tons in the total consumption. As the result, there is a large increase in the stocks during the year. The total amount in stock is now 94,000 tons, an unprecedentedly large total.

* * * *

A meeting of employers and workpeople connected with the cloth manufacturing, dyeing, and finishing branches of the woollen trade of Leeds and the district was held last month in Leeds, to consider the best means of remedying the present system of making pieces of cloth to such extreme lengths. It was resolved that steps be taken to effectually limit the length of ends of cloth, and that therefore all working men be requested to refuse, on and after May 1st, to work or handle any piece above fifty yards long, and that circulars be sent to all master finishers, dyers and fullers, and also to all manufacturers, earnestly requesting the former to refuse to take in, and the latter to discontinue the making of long lengths previous to that day.

* * * *

According to private letters received in the city from Mogador, the Moorish Government intends three months hence to open the port of Agadeer, which is about 90 miles to the south of Magador. The new port is much nearer than Magador to the province called Sus, whence comes a large supply of almonds and gum, and to which goes a considerable quantity of piece goods. The establishment of Christian merchants at Agadeer is expected to have a civilising influence on the country between Sus and that place, which is now infested by robbers, so that the roads are nearly impassable.

* * * *

A Committee of the French Senate has consulted the Chambers of Commerce, the Tribunals, Chambers of Arts and Manufactures, and other bodies on a bill for the protection of business names, styles, titles, &c., and the punishment of usurpation of exhibition awards. The opinions gathered are largely in favour of the measure, but many of the Chambers hold that the protection should not be extended indiscriminately to foreigners having establishments in France, but merely to those whose respective countries afford reciprocal rights to French citizens. A multitude of amendments are suggested on various details of the bill, some of them being intended to bring it into conformity with legislation on trade-marks.

* * * *

An American plant, the Agave, furnishes a very strong fibre, which might be employed for many purposes if suitable machinery were made to prepare it. It has long been put to many uses by the natives of Southern Mexico and Tucatan, and coarse thread of great strength has been made from it elsewhere. There are several varieties of the useful plant; the leaf, containing the fibres also, contains a quantity of gum and silica. In has, however, been found that the fibre of some varieties can be divided so finely as to be woven with silk. The fibre at present imported into London is prepared by hand, but machinery for the purpose is required. Perhaps the makers of rhea preparing machines can modify their machinery for the purpose.

* * * *

The *Pall Mall Gazette* remarks that the fact that it costs twice as much for an Englishman to correspond with India as for a Frenchman is not creditable to the "practical good sense" of Englishmen. Unfortunately, it does not stand alone. Our Post Office cannot see its way to joining the International Parcels Post, which has been adopted by France, Germany, and other countries on the Continent, and it is taking a long time even in introducing one in England itself. But the most striking instance of the comparative backwardness of the Post Office is its telegraph tariff. It is not to our credit that a poor country like Switzerland, which has to carry its telegraph posts up mountains and across ravines, with no large towns worth naming by the side of Birmingham or Bristol, should be able to have a half-franc telegraph charge, while the country which invented the penny post cannot send the smallest message under one shilling.

Dun's Mercantile Agency reports that there were 5,582 failures in the United States during the past year, with 81,155,932 dols. liabilities, against 4,735 failures and 65,752,000 dols. liabilities in the previous year. They say this increase in the loss by bad debts can hardly be interpreted as a favourable sign in the condition of the country; yet, compared with the larger figures of previous years, the result is not unsatisfactory. The failures and liabilities in 1881 have only been slightly over half those of 1878, the volume of trade being now probably four times as great as then, and from 18 to 25 per cent. more persons are engaged in business. The failures in 1878 were one out of every 64 in business, in 1880 one in 158, and in 1881 one in 140.

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A Belgian consular report from Egypt says that Belgian goods are, with very few exceptions, introduced into the Egyptian markets by English houses. Belgian firms almost invariably exact immediate payment for their goods, and as this system is naturally not more convenient in Egypt than in other countries, Belgian trade is necessarily much restricted in consequence. The Belgian Consul under these circumstances strongly urges the formation of an export society, established on firm bases with abundant capital, to develop Belgian trade, and enable it to dispense with the agency of intermediary agents. Such a society as that suggested could dispose of Belgian products abroad, could measure the best period and markets for selling goods, and collect the debts owing to the exporters. The principal reason for the smallness of Belgian exports to Egypt is to be found in the insufficient credit granted. English firms send linens far inferior to Belgian tissues, but better packed, more neatly folded, and more prettily finished.

* * * *

Twelve of the 25 to 30 cotton factories in Brazil are said to be represented in the Exhibition of Native Manufactures which has been opened in Rio. There are two classes of mills, those which spin their own yarn for weaving, and those which import yarn in the dyed and undyed state. The proprietors of all these concerns agree as to the desirableness of increasing the import duties on imported tissues, but beyond this point there is a divergency of opinion between them, the representatives of the former class wishing the increase to apply to yarns also, to which the representatives of the latter class naturally object. In its description of the Exhibition, the *Anglo-Brazilian Times* says that the superiority of the fabrics made from imported yarn is seen at the first glance, those made from Brazilian yarn being rough in texture and dull in colour. It is evident, says the Rio paper, that much improvement must take place in the spinning, dyeing, and finishing operations before the fabrics of exclusively native manufacture can stand comparison with foreign goods in regard to appearance as well as strength.

NOTICE TO ADVERTISERS.

Advertisements will be inserted at the following rates; (in all cases prepaid): *Twenty words, One Shilling; Sixpence* for each additional *Twelve words* or part of *Twelve*. The address being counted as part of the Advertisement.

Displayed Advertisements according to arrangement.

Mercantile Assistants, &c., Want Places.

A BRADFORD WARP DRESSER wants a situation, in or near Manchester: ten years' experience.—Address H. Leach, 103, Listerhills Road, Bradford.

WANTED, by an experienced Velvet and Velveteen Dyer, the management of a Dye Works, or would take a Situation as Foreman. 20 years' experience.—Address Mr. J. Williamson, 17, Bridgewater Avenue, Cross Lane, Salford, near Manchester.

AN experienced Young Man, 24, speaking French, requires a situation as CLERK, CORRESPONDENT, or ASSISTANT; thorough knowledge of the office and warehouse routine, bookkeeping, and the fancy and dry goods trade: moderate salary; would go abroad.—Address A. B., 28, Buckingham Place Road, London, S.W.

Mercantile Assistants, &c., Wanted.

WANTED, a thoroughly competent and steady CARDER, accustomed to Platt's revolving flat cards and frames and Bolton counts: a good wage given to a suitable and sober man. Apply, by letter only, to Messrs. J. and T. Garnett, Cox Green Mill, Turton, near Bolton.

WANTED, a Man accustomed to MARK WHITES at a PRINTWORKS. Apply, stating where last employed and wages required.—Kinder Printing Company, Hayfield, by Stockport.

Agencies, Travellers, &c.

WANTED, by a Wool Commissioner of Rhenish Prussia, the AGENCY of a good Bradford or Leeds House in Tops, Noils, Locks, &c., for Sale to Spinners.—Please address offers under S. H. 16, Messrs. Haasenstein and Vogler, Cologne.

ADVERTISER, known personally to the London Shippers, is desirous of Representing a Manchester or a Bradford House to same: references London and Manchester.—Address O. W. T., Porter's Lodge, East India Avenue, London, E.C.

AN Agent in Paris, well known amongst Paris Woollen Houses, Merchant Tailors, Mantle Makers, and Cap Makers, is open to REPRESENT an English Firm; good references.—Woodcock, 47, Rue Dauphiné, Paris.

Partnership.

WANTED, a Partner, with £1,000 capital, to secure extension of a contract for the sole sale of a very valuable article extensively used by printers, dyers, and others, and which secures large profits.—Apply G. B., care of Mr. John Southam, Solicitor, 78, Cross Street, Manchester.

Engines, Machinery, and Tools.

ON SALE, a New STOCKING-KNITTING MACHINE, with four heads, for power.—J. Leigh, 11, Egyptian Street, Bolton.

TO MANUFACTURERS.—TO BE SOLD, 70 CALICO LOOMS, 36in. reed space, to weave strong or light goods, in first-rate order, by Butterworth, of Burnley: may be seen at work: room wanted for other purposes.—Apply at the Warth Mills, Bury.

TEN 144-Fly Spinning FRAMES and Set of nearly new DRAWING, by Smiths; can be run where they now stand at Waterloo Mills; first-class power.—Apply A. G. Marshall, Allan Mill, 135, Thornton Road, Bradford.

Manufactories, Works, &c.

WOODCHESTER MILL, near Stroud, Gloucestershire.—This valuable Mill and Premises, with Land and Cottages adjoining, to be Let or Sold on very moderate terms. There is a powerful steam engine, with two good boilers; also two waterwheels of about 30-horse power; immediate possession may be had. For further particulars and terms apply to Mr. E. T. Wise, Woodchester; or to Messrs. G. B. and A. E. Smith, Solicitors, Nailsworth.

THE GAZETTE.

Adjudications of Bankruptcy.

Richardson Joshua Rogerson, and James Richardson, trading as R. Richardson and Co., Briggate, Leeds, rag and mungo merchants.

Bradley Chrstopher, and Walter Bradley, trading as C. and W. Bradley and Co., Bradford, machine wool comb makers.

Christian James R., Donegall Square South, Belfast, linen merchant.

Liquidations by Arrangement or Composition.

Butler Joseph Walton, Ashton-under-Lyne, cotton spinner.

Lees Thomas, trading as Thomas Lees and Co., Tithebarn Street, Liverpool, cotton broker.

Barlow James William, Radcliffe, Lancashire, bleacher and dyer.

Washington George, and Isaac Smith Washington, trading as Washington Brothers, Old Cock Yard, Halifax, wool and waste dealers.

Whitehead Edmund, Piccadilly, Manchester and Middleton. silk and poplin manufacturer.

Cockroft John, Sowerby Bridge, woollen manufacturer (separate creditors).

Culpan Nathan, and John Cockcroft, trading as A. Pickles and Co., Sowerby Bridge, Yorks, woollen manufacturers.

Culpan Nathan, Sowerby Bridge, woollen manufacturer and innkeeper (separate creditors).

King James, Central Avenue, Clarendon Park, Knighton, and Friar's Causeway, Leicester, hosiery manufacturer, (separate creditors.)

Ford William James, Overton Road, Humberstone, and Friar's Causeway, both Leicester, hosiery manufacturer (separate creditors.)

Shoesmith George, Argyle Street, Halifax, wool dealer.

Sequestrations.

Milree James, Poliockshaws, power loom cloth manufacturer, as an individual and as a partner of the firm of William Young and Co., there, power-loom cloth manufacturers.

Houston Alex. and Sons, Calderville, by Airdrie, silk and calico printers, and John Houston and Robert Houston, there, sole partners as such and as individuals.

Trustees Appointed.

Smith James H., and Herbert E. Smith, trading as R. W. Smith and Co. (Liquidation), Nottingham, hosiery manufacturers. Trustee, T. Leman, Nottingham, accountant.

Smith Herbert E. (Liquidation), Nottingham, hosiery manufacturer (separate estate). Trustee, T. Leman, Nottingham, accountant.

Smith James H. (Liquidation) Wildman Street, Nottingham, hosiery manufacturer (separate estate). Trustee, T. Leman, Nottingham, accountant.

Drake, Wilkinson (Liquidation), Trinity Road, Halifax, wool dealer. Trustee, J. Ainley, Bull Close Lane, Halifax, accountant.

Bayley William B. (Liquidation), Bolton, cotton spinner. Trustee, W. Milne, 63, Brown Street, Manchester, accountant.

Masterman Henry (Bankrupt), Seward Street, Goswell Road, London, rug manufacturer. Trustee, J. Turner, Crown Mills, Dewsbury, Yorks, yarn spinner.

Dividends.

Radcliffe Jabez (Liquidation) Halifax, grocer, wool and waste dealer. 1st and final dividend 3s. 5¾d.; J. S. Lees, 5, Southgate, Halifax.

Brook William (Bankrupt), Lowerhead Row, Leeds, mercer and laceman, 2nd and final dividend 2d.; C. Beevers, 26, Commercial Street, Leeds.

Briggs George E. (Bankrupt), Bradford, worsted manufacturer. 2nd and final dividend 6s. 11d.; on and after January 19: B. and E. Musgrave, Bradford, acconntants.

Robertshaw William (Bankrupt), Bradford and Allerton, woolstapler and top maker. 1st and final dividend 2s. 8d.; P. K. Chesney, 1, Leeds road, Bradford.

Blamires Edward (Liquidation), Liversedge and Cleckheaton, both Yorks, blanket manufacturer. A dividend of 3s. 6d.; J. Firth, Northgate Cleckheaton.

Bills of Sale.

Farrington Mark, Wood End Scar, Lockwood, near Huddersfield, cloth finisher, for £10 10s., to Huddersfield Advance Co.

Hyde Samuel Radcliffe, Clough Mills, Ludworth, Derbyshire, cotton waste dealer, for £250, to James Wood.

Edleston James, and Frank Owtram, cotton manufacturers, trading as H. C. Owtram and Co., of Manchester Mill, and Castle Street Mill, Preston, (to secure purchase money for same) for £28,260 10s. 2d. mortgage, to Fanny Owtram and another (executors of Henry Cary Owtram, deceased.)

Carter Robert Meek and others, Burley Grange, Leeds, cloth finisher, for £800, to Henry W. Wolffe and another.

Robinson Thomas, Calder Bank Terrace, Ravensthorpe, Dewsbury, dyer, for £100 to Edwin Robinson.

Heywood Edmund, Clayton-le-Moors, Lancashire, and James Gilderd, of the same place, trading as Abraham Heywood and Co., calico printers, for £5,000, to James Bowker.

Dissolution of Partnerships.

Grey John and Co., Burnley, cotton manufacturers.

Marshall and Halliday, Selkirk, dyers. Debts by H. Halliday, who continues the business in his name.

Stewart, Melven and Co., Ingram Street, Glasgow, manufacturers.

Bamford and Sons, Meltham, Yorks, silk throwsters. As regards William Bamford.

Hall, Laverton and Schwabe, 15, Chorlton Street, Manchester, manufacturers and merchants. As regards Walter Laverton.

Evans P. C. and Son, Brimscombe Upper and Lower Mills and Brimscombe Port Mills, Gloucester, woollen cloth manufacturers.

Eastwood Daniel and Sons, Huddersfield and Wool Exchange, wool merchants.

Milligan John, Son and Co., Bradford, and Gresham Street, London, stuff merchants. As regards Thomas H. Woodward.

Milligan John, Son and Co., Bradford, and 49, Gresham Street, London, stuff merchants. As regards George Sharow.

Marriott W. and Co., Liverpool, cotton brokers. As regards William F. Leather.

Schwenn, Modera and Co., Manchester, London, Glasgow, Dundee and Huddersfield, merchants. As regards Frederick Schwann.

Swallow G. and Co., Manchester and Middleton, cotton merchants.

Wale H. and Sons, Leicester, hosiery manufacturers. Debts by William Henry and Arthur Wale.

Finlay R. G. and Brothers, South Frederick Street, Glasgow, gingham manufacturers. As regards R. G. Finlay only, debts by remaining partners.

Anderson and Eller, Dundee, linen merchants, &c. Debts by Maurice M. Eller.

Blair and Dick, Causeyside Street, Paisley, finishers. Debts by John M'Gowan, 14, Gilmour Street, Paisley. The business continued by Allan Blair, as Blair and Co.

PATENTS.

Applications for Letters Patent.

5725 Richard Barker Nairn, Kirkcaldy, Fife Scotland, "Improvements in machinery for the manufacture of linoleum and like fabrics."

5726 Robert Speight and Thomas Speight, commission wool combers, Bradford, "Improvements in winding machines or apparatus employed in the preparation of the fibres for 'Noble's' combing machines or any other combing machines requiring winding apparatus."

22 Arthur Godfrey Tottem, 17, Viceroy Road, Clapham, Surrey, warehouseman, and John Brown Gloag, 17, Bath Street, Newgate Street, London, commission agent, "Improvements in imitation lace printing."

39 Joseph Anthony Dixon, 175, West George Street, Glasgow, solicitor, "Improvements in the manufacture of colouring matters suitable for dyeing and printing."

58 Herbert John Haddan, Kensington, Middlesex, "Improvements in combing machines."—A communication.

63 Peter Jensen, 33, Chancery Lane, Middlesex, "Improvements in rendering fabrics, theatrical scenery, and other objects uninflammable."—A communication.

91 Frederic William Pim and Thomas Sands, Greenmount Spinning Company, Harold's Cross, Dublin, Ireland, "Improvements in heddle frames of weaving looms."

107 John Ashworth, Rochdale, machinist, "Improvements in or applicable to machines for tentering, stretching, and otherwise treating fabrics, part of which improvements are applicable for other purposes."

113 Henry Cryer, Ilkley, Yorks, "Improvements in the manufacture of embossed fabrics."

115 William Birch, Salford, Lancaster, machinist, "Improvements in the construction of apparatus employed in washing, soaping, dyeing, and other similar operations."

288 John Auchinvole, Glasgow, merchant, "Improvements in and connected with the bleaching and dyeing of cotton, flax, jute, wool, silk, and other fibres."

304 Thomas Watson, Ferguslie Works, Paisley, foreman machanic, "Improved oil cap in wharve of spindle for spinning and doubling."

307 Thomas Sutcliffe, Todmorden, weaver, for an invention of "Improvements in weaving looms."

312 William Robert Lake, and Co., patent agents, Southampton Buildings, London, "Improvements in or relating to spinning machine spindles."—A communication.

323 Benjamin Alfred Dobson, of the firm of Dobson and Barlow, machine makers, Bolton, Edward Gillow, foreman, and David Davies, mill manager, Bolton "Improvements in spinning machinery."

325 James Reid Lawson, Glasgow, designer, "Improvements in producing chenille or fur material for the manufacture of carpets or other pile fabrics, and in apparatus therefor."

342 William Henry Allen and Richard Wright, both of Lambeth, Surrey, and William Lawrence Williams, Westminister Chambers, Middlesex, "Improvements in machinery or apparatus for starting, stopping, and reversing steam and other engines."

131 Henry Dewhirst, Aspley Print Works, Huddersfield, "Improvements in the method of and apparatus for fixing bronze and brocades on woven or felted fabrics."

152 Edwin Boden, Manchester, "Improvements in the construction of apparatus for dyeing or washing hanks of yarn, cord, or braid."

153 John Rawlinson Richards, Kirkham, Preston, "Improvements in the construction of shuttles used in looms for weaving."

154 George Bodden, Oldham, "Improvements in apparatus for lubricating the spindles of machines employed for preparing, spinning, doubling, and twisting cotton and other fibrous substances."

161 Jules Roussel, fils, Roubaix, France, "Improvements in machinery for spinning, twisting, and doubling cotton and other fibre."

164 Frederic William Pim and Thomas Sands, Greenmount Spinning Company, Harold's Cross, Dublin, Ireland, "Improvements in shuttle-boxes used in power-looms."

167 James Allan, 36, Richmond Crescent, Barnsbury, N, "Improvements in machinery and appliances for dyeing and colouring felt, jute, or other textile or porous fabrics."

171 Christopher Turner, Colne, Lancaster, "Improvements in looms for weaving."

233 Edward Clarke, Todmorden, mill manager, "Improvements in machinery or apparatus used in ring-spinning."

238 John Dodd, mechanical engineer, and George Little, mechanical engineer, Oldham "Improvements in apparatus for lubricating the spindles of spinning and doubling machines."

243 Henry Livesey, Blackburn, machinist, "Improvements in looms for weaving."

366 Samuel Cunliffe Lister and José Reixach, Manningham, Yorks, "Improvements in power looms for weaving figured pile fabrics."

373 John Rawlinson Richards, Kirkham, Preston, "Improvements in the construction of shuttles used in looms for weaving."

423 Charles Alfred Barlow, of the firm of Henry Bernoulli Barlow, of Manchester, in the county of Lancaster, patent agent, for an invention of "Improvements in the manufacture of machine embroidery."—A communication.

429 William Cliffe, machine maker, and Thomas Edward Ainley, scribbling engineer, both of Golcar, and James Shaw Dyer, of Huddersfield, all in the county of York, for an invention of "Improvements in machinery or apparatus for feeding wool and other fibrous substances to carding machinery."

430 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, for an invention of "Improvements in roving machinery."—A communication.

444 Frederick Albert Gatty, of Accrington, in the county of Lancaster, dyer and calico printer, for an invention of "Improvements in dyeing cotton yarns and yarns of other vegetable fibre in the cop."

447 Edwin Rothwell and William Andrew Rothwell, both of Walkden, in the county of Lancaster, for an invention of "Improvements in or applicable to sectional warping or beaming machines."

455 Richard Hindle and George Greenwood, both of Blackburn, in the county of Lancaster, for an invention of "Improvements in machinery or apparatus employed in beaming yarn."

Grants of Provisional Protection for Six Months.

22	23	63	91	4206	5190	5340	5341
5370	5410	5414	5438	5443	5449	5458	5480
5531	5537	5546	5594	5626	5645	5658	5678
5686	5691	5711	5713	5726	5741		

Notices to Proceed.

61	3692	3791	3827	3851	3892	3896	3931
3935	4014	4031	4056	4097	4112	4129	4132
4140	4143	4223	4432	4457	4524	4954	5329
5340	5343	5345	5427	5438	5480		

Patents on which the Stamp Duty of £50 has been Paid.

84 James Kerr, of the firm of F. Steiner and Co., Church, Lancaster, "Improvements in apparatus for delivering woven fabrics."

72 John Dodd, Oldham, mechanical engineer, "Improvements in mules for spinning and doubling cotton and other fibrous materials."

117 Alexander Melville Clark, Chancery Lane, Middlesex, patent agent, "Improved compositions for rendering textile fabrics, paper, and other materials uninflammable."—A communication.

235 James Schofield, cotton manufacturer, James Walton, manager, and Thomas Holt, carder, Littleborough, Lancaster, "Improvements in machinery for carding fibres."

264 William Walton Urquhart, Joseph Lindsay, and Robert Allan, Dundee, North Britain, engineers, "Improvements in cop-winding machinery."

294 Ernest de Pass, of the Office for Patents, 68. Fleet Street, London, patent agent, "Improvements in machines for combing the filaments of textile materials."—A communication.

296 William Murray, Ettrick Road, Selkirk, spinner, "Improvements in the twisting of fibrous materials, and in the machines or frames used in such twisting."

541 John Dewrance and George Henry Wall, 176, Great Dover Street, Borough, Surrey, "Improvements in lubricators."

Patents on which the Stamp Duty of £100 has been Paid

115 Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in knitting hats, caps, and other articles, and in machinery for the same."—A communication.

345 Henry Thomas Palmer, Middleton, Lancaster, consulting engineer, "Improvements in connection with the footsteps and lower ends of the spindles of mules and mule doublers."

Patents Sealed.

3045 John Broadbent, Huddersfield, designer and loom tuner, "Improvements in shuttles of looms for weaving."

3178 Thomas Taylor, Derby, "Improvements in the method of and apparatus for fastening or securing the rubber threads woven in elastic fabries, and in self-acting motions for letting off the warps in looms for weaving the same, applicable also to smallware looms."

3046 Thomas Coulthard, Preston, machinist, "Improvements in machinery or apparatus for spinning and doubling cotton and other fibrous materials-"

3066 Henry Robinson, Bolton. spinning manager, "Improvements in mules for spinning and doubling cotton and other fibrous materials."

3176 Edward Crossley, Giulio Marchetti, carpet manufacturers, Richard Cochrane, Manager of the Weaving Department, and William Mallinson, Designer, Halifax, "Improvements in the manufacture of Brussels, terry, pile, or other carpet."

3233 Thomas Coulthard, Preston, machinist, "Improvements in machinery or apparatus for spinning and doubling cotton and other fibrous materials."

4213 James Worrall, Ordsall, Salford, dyer, "Improved apparatus for drying cut pile fabrics."

3237 James Robinson Hancock, of the firm of Smith and Hancock, Crocus Street, Nottingham, machinists, "Improvements in bobbin-net or twist lace machines, and apparatus applicable thereto."

3726 Ernest de Pass, of the Office for British and Foreign Patents, 68, Fleet Street, London, patent agent, "Improvements in combing-machines."

4251 Frederick Versmann, Ph.D., consulting chemist, New Charlton, Kent, "Improvements in the manufacture of floor-cloth."

3080 John Clayton and Thomas Richmond, Burnley, "Improvements in looms for weaving."

3092 Frederick Craven, Brighouse, engineer and machine maker, "Improvements in tentering and drying machines."

4531 Joseph Anthony Dixon, 175, West George Street, Glasgow, solicitor, "Improvements in the production of colouring matters, and in the use of same for dyeing and printing."—A communication.

4466 Walter Dexter, Nottingham, "Improvements in warp or straight bar knitting-machines, and in the fabric produced thereon."

4588 Carl Pieper, civil engineer and patent agent, 109-110, Gneisenaustrasse, Berlin, S.W., Prussia, "Improvements in fleece-dividers for carding-machines."

3323 Charles Herbert Openshaw, Bury, cotton spinner, "Improvements in the method of and means for mounting the spindles of spinning machinery."

3949 William Currie, Belfast, Antrim, Ireland, "Improvements in apparatus for oiling the shafting, spindles, and other moving parts of spinning, roving, and other machinery,"

4422 Thomas Briggs, Manchester, "Improvements in the construction of machinery or apparatus employed for spinning and doubling yarns or threads."

4711 John Makin and Jabez Edward Johnson-Ferguson, Bolton, Improvements in figured fabrics, and in the method of weaving the same."

4713 John Maktin and Jabez Edward Johnson-Ferguson, Bolton, "Improvements in weaving certain figured fabrics."

5167 Aenri Adrien Bonneville, of the British and Foreigh Patent Offices, 8, Rue de la Chaussée d'Antin, Paris, France, and 90, Cannon Street, London, patent agent, "A new or improved means of manufacturing woollen fabrics."—A communication.

4671 William Robert Lake, of the firm of Hazeltine, Lake and Co., patent agents, Southampton Buildings, London, "The manufacture of improved rings for spinning frames."—A communication.

4906 John Chisholm and John Clegg, Oldham, "Improvements in mules and twiners."

3610 Henry Moses Mellor, of the firm of Moses Mellor and Sons, Arkwright Street, Nottingham, "Improvements in the manufacture of circular ribbed fabrics, and in circular hosiery frames to be used for this purpose,"

5223 George Pitt, Sutton, Surrey, "Improvements in ornamented fabrics, and in the processes and apparatus for the manufacture of the same."—A communication.

3718 Justus Wolff, 118, Chapel Street, Manchester, consulting chemist, "Improvements in sizing, mordanting, dyeing, printing, and finishing textile and other materials. and in apparatus connected therewith, partly applicable to other purposes."

Copyright of Designs.

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Class VI., Carpets.

375,157-58 The Heckmondwike Manufacturing Company (Limited), Heckmondwike, Yorkshire.
375,276 James Humphries and Sons. Kidderminster.
375,413 Greaves, Fidoe and Co., Kidderminster.
375,428. H. R. Willis and Co., Kidderminister.
375,891 Shepherd and Beveridge, Kirkcaldy, Scotland.
375,907 H. R. Willis and Co., Kidderminster.
376,221 Henry Lea and Co., Dewsbury.
376,222 John Crossley and Sons (Limited) Halifax.
376,223,26 H, R. Willis and Co., Kidderminster.

Class XI., Furnitures.

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375,294-96 Daniel Lee and Co., Fountain Street, Manchester.
375,278 Beith, Stevenson and Co., 14, Bridge Street, Manchester.
375,475 The Rossendale Printing Company, Manchester.
375,476-79 Thomas Hoyle and Sons (Limited), Manchester.
375,485-86 Reiss Brothers, 11, Quay Street, Manchester.
375,600 S. and F, Sternberg, 39, Dickinson Street, Manchester.
375,601 Robinson and Co., Isle of Cinder, Swinegate Leeds.
375,601-604 Daniel Lee and Co., Fountain Street, Manchester.
375,605 Alexander Drew and Sons, 15, Nicholas Street, Manchester, and Lower House, Burnley.
375,762 McNaughton and Thom, Birkacre, Chorley, and 42, Portland Street, Manchester.
375,763 Arning and Co., 11, Bloom Street, Manchester.
375,887-88 The Strines Printing Company, 19, George Street, Manchester.
375,889 Alexander Drew and Sons, 15, Nicholas Street, Manchester, and Lower House Burnley.
375,890 The Rossendale Printing Company, Manchester.
375,908-10 Alexander Drew and Sons, 15, Nicholas Street, Manchester, and Lower House, Burnley.
376,144 Daniel Lee and Co., Fountain Street, Manchester.
376,215-17 Alexander Drew and Sons, 15, Nicholas Street, Manchester, and Lower House, Burnley.
376,402 Thomas Hoyle and Sons (Limited), Manchester.
376,403 George Andrew and Sons, Compstall and Manchester.

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Illustrations.

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A Design for a Cretonne.
A Design for a Fancy Figured Fabric.
Hanson's Steam Pump.

Notices.

The Half-Yearly Subscription—payable in advance—including home postage, is 3s. 6d. Cheques and Post Office-Orders to be made payable to H. & R. T. Lord, 3, Gerrard Street.

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The Proprietors will feel greatly obliged if any of their readers in making enquiries of, or opening accounts with Advertisers in this paper, will kindly mention the *Journal of Fabrics* as the source from whence they obtained their information.

The Associated Chambers of Commerce.

The Twenty-second Annual Meeting of this Association was held in London on the 28th ult., under the presidency of Mr. Monk, M.P. The attendance of delegates was very large, not fewer than forty Chambers throughout the kingdom being represented. The report which has for some weeks been in the hands of the members, regretted, that owing to the pre-occupation of Parliament during last session with measures connected with Ireland and the persistent obstruction of all legislation in the House, no important commercial measures were passed. Special reference was made to the Bills of Sales Amendment Bill, prepared by the Association and introduced into the House of Commons by Mr. Monk, M.P., which was read a second time and then referred to a Select Committee. The report stated that as amended by that Committee the bill did not meet all the requirements of the Association; but that the President had re-introduced the bill this session (after consultation with the Attorney General, who was Chairman of the Select Committee) in a form which it was hoped would give satisfaction to the Association, and receive the support of the Government. The report then referred to other subjects, perhaps the most important of which was foreign tariffs.

The Chairman, in moving the adoption of the report, made reference to the Bills of Sales Amendment Bill; the Partners Law Amendment and Consolidation Bill, which was blocked by Mr. Whitley, and talked out by Mr. Warton, during last session, and the Inferior Courts Extension Bill, which was blocked by Mr. Callan, an Irish member. He strongly condemned the system of blocking bills, and said it behoved the Chambers to put a certain amount of pressure on their members to induce them to support the Government when endeavouring to secure its proper legislative functions. With regard to railway rates and fares, he stated that he had been instrumental in getting the Committee to sit twice a week instead of once, as had been determined at the first sitting by a narrow majority and he believed that in a fortnight or so the Committee would have finished the evidence as to railway rates, and the time would come when railway fares would have to be dealt with. He appealed, therefore, to those members who were interested in the subject, to be prepared with their evidence before Easter. He next made mention of the Treaty negotiations, between this country and France, saying it was to be regretted that the negotiations should have fallen through entirely; but he thought that the Association owed a debt of gratitude to the Government, and especially to Sir Charles Dilke, for the firm manner in which they had upheld the resolutions of last year, not to negotiate any treaty which should be of a reactionary or retrograde character, which would certainly have been the case had they been bound to a treaty for a period of ten years. The report was adopted unanimously.

Bills of Exchange.

On this subject Mr. J. Behrens (Bradford), moved the thanks of the Association to Sir John Lubbock for having re-introduced the bill on this question, which was read a second time last session; and also—

"That the committee of the council be reappointed to watch the progress of this bill through Parliament, to suggest amendments, or to recommend its reference either to a Select Committee or a Royal Commission for the purpose of consolidating and amending the law on bills of exchange, and of establishing, if possible, an international agreement between the English law and that of other commercial countries."

Mr. Illingworth, M.P., seconded the resolution, which was adopted.

The Patent Laws.

Mr. Marshall (Leeds), then moved and Mr Sampson Lloyd seconded:—

"That in the opinion of this association the present Law of Patents is very unsatisfactory, inasmuch as it greatly interferes with and discourages invention, and that the Executive Council urge Her Majesty's Government to introduce a bill for the amendment of the law, having for its principal objects the simplification of the formalities and reduction of the fees on obtaining letters patent."

Mr. Sampson Lloyd afterwards moved on behalf of the Birmingham Chamber and Mr. Clark (Wolverhampton), seconded the following motion:—

"That any amendment of the Patent Laws ought to contain provisions compelling patentees to manufacture within the United Kingdom all goods which are the subject of an English patent, or at least that they should be compelled to grant licenses to English subjects; that the cost of provisional protection should be reduced to a merely nominal sum in order to afford facilities to poor inventors; and that a memorial be presented to the Board of Trade accordingly."

The resolution provoked some discussion, Mr. Morley, M P. strongly opposing and moved the omission of the first clause. Mr. Seymour (Coventry), supported Mr. Morley. The meeting then voted on the motion by Chambers, when Mr. Lloyd was supported by 36 to 26; but the majority was too small to admit of action being taken in it under the rules of the Association. Mr. Wigan (Dublin), moved a resolution to the effect that as the bill promoted by the Society of Arts embodied, to a large extent, the opinions of the Association expressed on various occasions, the Executive Council be requested to give it all the support in their power. This motion was put and lost.

Mr. Watson (Cardiff), then moved a resolution in reference to

The Bankruptcy Law,

which he argued had failed chiefly because it attempted to discharge debtors from their liability to pay their debts. The motion ran as follows:—

"That future bankruptcy legislation should be confined to the equitable distribution of insolvent estates and the encouragement of legitimate trading, leaving the cancelling of contracts entirely in the hands of those who made them."

Colonel Hill (Cardiff), seconded the resolution, upon which there was rather a sharp discussion, Mr. Williams (Walsall), eventually proposing an amendment to the effect that reform of procedure rather than reform of the law was necessary, and that the Chambers support Mr Chamberlain in his endeavours to remove proved defects in existing Acts. The amendment was seconded by Mr. Walker (Wolverhampton). The motion was rejected, and the amendment met with a similar fate. The Chairman, during the discussion, stated that the Association bill had been that morning, introduced into the House of Commons, in consequence of which, a number of resolutions from Leeds, Bristol, and other places were withdrawn. Mr. Smith (Barnsley), moved a resolution urging the Government to deal with the

subject at the earliest moment, and asking the Executive Council to watch all bankruptcy bills before Parliament so as to see that the resolutions from the Chambers on the subject on former occasions were incorporated. This was agreed to by a large majority.

Bills of Sale

The Bristol Chamber proposed, and the Derby Chamber seconded, that the resolutions passed on the Bills of Sale Act Amendment Bill at the autumnal meeting be approved and confirmed, and that the President and Executive Council be thanked for the measure which they have introduced. An amendment was proposed, but afterwards withdrawn and the original resolution carried.

The Partnerships Bill.

A resolution was then passed approving of the Partnerships Bill introduced by the President, who said that he should do all he could to ensure its becoming law this session.

The Parcels Post.

Mr. Alexander (South of Scotland) moved a resolution in favour of a Pattern and Parcels Post, and quoted statistics to show that patterns and parcels could be sent abroad cheaper by post than they could be transmitted to places in the United Kingdom. Therefore these anomalies should be at once amended. They wanted the post to carry much greater weights at a fixed rate. The railway companies made nearly as much out of parcels as all their passenger traffic produced. Thus it would pay the Government to establish a parcels post, and it would be of great advantage to the public. Various delegates spoke on the motion which was passed unanimously.

Telegraphic Charges.

A long discussion then took place on the excessive and anomalous charges made for foreign telegrams, and a resolution was proposed and seconded in favour of a deputation to wait on the Postmaster General with a view to negotiations being entered into for cheapening the cost of foreign telegrams, which was carried; and afterwards Mr. Mills (Huddersfield), moved :—

"That in the opinion of this Association the present rates of telegraphic charges are excessive, and that a reduction therein would prove not only a great boon to the country, but would prove remunerative to the post-office."

The motion was carried, and a memorial order to be sent to the Postmaster General on the subject.

A resolution was afterwards carried, which was proposed by the Sunderland Chamber in favour of giving interim receipts at Post Office Savings Banks, when Government Stock was purchased through them.

Foreign Tariffs.

Mr. Drew (North Staffordshire), moved a resolution to the effect :—

"That a searching investigation be made into the effect upon British trade of the excessive hostile tariffs of foreign nations."

Mr. Cobden's chief point was that other nations would follow our Free Trade leanings, but Mr. Gladstone had now clearly said that Mr. Cobden's hope had not been realised. The imports from foreign countries had been so great that it was high time that such an investigation should take place. If pressure could be brought on Parliament to appoint an independent Commission to visit the great centres of British industry, they would bo able to obtain some practical facts which wouid be more useful and convincing than the combinations of figures now doing duty for that purpose.

Mr. Sampson Lloyd seconded the motion, on the ground that things had all changed since Free Trade was first adopted in England. Then we successfully competed with foreign nations, but now we could not do so.

Mr. Norwood, M.P., thought it rather selfish that we should expect to have all manufactures in our own hands. Protection crippled manufactures, and that being so, England could command the chief trade in all neutral markets, and would continue to do so so long as Protection continued abroad. He wished to see the system of model tariffs which the supporters of Fair Trade would put before the country. They might beat about the bush, but it really came to a question of duty upon corn and the food of the people. Our trade was increasing and not decreasing, and therefore it was absurd to ask for this inquiry.

Mr. S. Morley, M.P., suggested that it would be better to employ their time in trying to convert countries which approved Protection to adopt a Free Trade policy. He contended that the state of trade in the past ten years in no way warranted the inquiry which was sought for. He believed before long they would see a decided diminution in the tariffs of the United States. England would never agree to taxation on the food of the people, and he thought the enquiry could only have a mischievous result.

Other delegates joined in the discussion, after which Mr. Drew, in reply, said he believed this enquiry was strongly desired by the rising generation, who preferred national advantages to party politics.

The motion, on being put to the vote, was lost.

A number of resolutions on subjects of minor importance were afterwards discussed and passed, and the meeting dissolved, the business during the session having been got through satisfactorily.

Silk Culture in New Zealand.

In former years papers of an interesting character on the production of Silk in India, and on the sericiculture in Australia, have occupied the attention of the Society of Arts; but perhaps none have been given of greater interest, and at the same time of more value than that which was read before the Society a few days ago by Mr. William Cochran, on "The physical and social capabilities of New Zealand for Tea and Silk culture." In his paper, Mr. Cochran glanced at the principal features of the countries in which tea and silk farming are at present conducted, especially taking into account the climate, comparing the facilities offered for their cultivation in New Zealand with the present state of the culture in China, India, Ceylon, &c. The reader showed that from inquiries that had been instituted that the climate in parts of the Middle Island, particularly in the interior of Otago, is pronounced by intelligent Chinese residents on the spot, as well as by observant travellers, closely to resemble that of the tea and silk districts of China, and that the mulberry, the ailanthus, the castor-oil shrub, and other silkworm feeding plants grow luxuriantly in various districts, but notably in the province of Auckland. We cannot do better than quote Mr. Cochran's remarks on the practical achievements in silk culture, and the cost of producing silk in New Zealand.

"The difficulties which attended the early experiments in silk culture in Australia, as well as subsequent successes, must already be so well known that recapitulation is unnecessary. With similar efforts in New Zealand, however, there may not be the same degree of familiarity. Whilst the advocates of sericiculture in Australia were in full activity, and sbortly after the formation and first meeting in London on the 18th February, 1869, of "The Silk Supply Association," the promotion of silk culture in New Zealand found an able exponent in the person of Mr. T. C. Batchelor, of Nelson. On the 8th January, 1870, that gentleman introduced the subject to the notice of the Colonial Government, and followed up his first letter by a series of communications which, with other important contributions from Dr. Hector, of the Geological Survey, and several gentlemen connected with various local acclimatisation societies, appeared afterwards in the form of a State paper. In his letters, Mr. Batchelor pointed out to the Government, and endeavoured to arouse his fellow Colonists to appreciate, the financial importance of an industry capable of yielding a return of £100 per acre. For several years prior to 1870, this gentleman had been cultivating the Tuscan mulberry and producing silk to a limited extent: and he mentioned in one of his letters to the Colonial Secretary that four years experience had convinced him that an annual yield of even £100 per acre would indeed fall greatly short of the result he expected a few years later, when his trees had grown older. However, beyond calling attention to the suitability of parts of New Zealand for sericiculture, eliciting some interesting information through official sources, and obtaining an offer from the Government of a bonus for the

encouragement of the industry, no further result of Mr. Batchelor's advocacy at that time appeared. At a later date, however, the subject was again revived, partly through the display at the Sydney Exhibition, in 1879, of some creditable specimens of cocoons and raw silk reared in Auckland and Canterbury, and partly because of the untiring vindication of the industry on the part of a few believers in this capability of the Colony. Thus, Mr. Batchelor's agitation of 1870 was not entirely fruitless, as sericiculture was subsequently included among the matters for inquiry by the members of "The Colonial Industries Commission," who began and ended their labours in 1880. Their report contained several recommendations for the promotion of sundry local industries, and some useful remarks by a Government employé, Mr. Federli, relative to sericiculture; but the Parliament of New Zealand, seems to have as yet taken little action for the encouragement of either tea or silk cultivation, and the subject has probably been shelved for another year. This apparent apathy is unfortunate, as, under generous treatment from a sympathetic executive, chasericulture might have been at the present moment of great importance to the Colony. That a fair estimate of the cost of silk production may be found for a new country like New Zealand, it is desirable to avoid the usual old continental centres, where the industry, through the condensed experience of centuries, has been brought, in every item, to a pitch bordering on perfection. A suitable illustration is furnished by a recent traveller in Asia Minor, where it is said that, in Turkestan, a peasant's family of four persons can raise on an average each season about 108 lbs. of cocoons from one ounce of silkworms' eggs, obtained from 1½ lbs. of cocoons, and fed on the leaves of 20 mulberry trees, costing the equivalent of 38s. Should the family own the trees, the cost of food is, of course, saved, and goes to increase their profit The result of this little venture is a total cost of 5s. 0¾d per lb. for the 9 lb of marketable silk produced, or 4d. less to the mulberry proprietor, whilst the product may fetch in the European market from 20s. to 25s. per lb. Thus the ignorant Turkish labourer, notwithstanding a great waste of material, realises a profit of 6½d. per lb., and the middleman, who purchases from him, immensely more, from an occasional industry extending over only a few weeks. Another example is to be found in the earliest achievements of the Victorian Ladies' Sericicultural Company, Australia, founded by Mrs. Bladen Neill and some of her friends, an account of which was read to the members of this Society by that energetic lady, in 1876. Experiencing many disappointments through diseased eggs, she visited the chief silk districts of Europe in search of healthy *graine*. At length a supply of robust eggs was procured in Switzerland from renovated breeds reared on the confines of perpetual snow, and from these, conveyed to Australia packed in Ice, the magnaneries were re-stocked, with the result that, among the first produce were samples of silk valued in London at 40s. per lb. The cost of production was about 8s. 8d. per lb., the average of those three examples being 6s. 1¾d."

After dealing with the climatic aspect of the question, Mr. Cochran took into consideration the question of labour, saying, "It is one thing to succeed on an experimental scale, but quite another matter to achieve a pecuniary triumph in a totally new undertaking, in a new country, upon commercial lines, in the midst and in spite of scarce and expensive labour; as at the present moment the rates of ordinary unskilled European labour are several times higher than in the silk-producing districts of the world." To meet this difficulty he suggested the tapping of five sources—European, Chinese, Indian, Polynesian, and Maori—at the same time keeping in view "that as time went on, and as inducements to immigration for the purpose of engaging in these attractive industries became well known and appreciated, hundreds, perhaps thousands, of respectable European families will eagerly flock to New Zealand, and thus supply not only some of the ordinary labour, but the deft manipulative skill, the discriminative foresight, and the high intelligence which chasericulture imperatively demands." Mr Cochran afterwards gave reasons why the culture of tea and silk must be taken together, and stating that he did not think there would be much probability of either industry being remunerative if carried on alone. "In the most favoured silk-producing districts the season or harvest is generally over in from six to seven weeks. Some additional expansion of harvest time may be artificially effected by the judicious selection and introduction of other silk-producing worms besides the mulberry-feeding *Bombyz mori*. But after every known modification of sericiculture shall have been tried, the chief part of every year must necessarily remain unimproved to the farmer confining himself to silk production alone, on account of the forced suspension at the end of three months, of the industry, through lack of material. Under such circumstances it will be evident that no sericiculturist could afford to retain a full staff of employés in comparative idleness for nine months in the year. Unlike the comparatively limited duration of the mulberry leaf harvest, as suited to the food wants of the silkworm, the seasons for tea cropping and manipulation, beginning later, may continue for six, eight, or even nine months. Thus the addition of the tea industry to that of sericiculture provides a bridge over the hiatus left by the earlier cessation of the latter, and the union of the two promises almost consecutive employment for the whole twelve months. Again, the accession of a tea trade to that in silk will create that desideratum for every commercial enterprise—a rapid turnover of capital and a constant inflow of revenue. From the large and increasing demand for tea at the Antipodes, it may safely be reckoned that all that could be produced on the spot would, for many years to come, find an immediate sale within the colony and in Australia, and so a continual influx of earnings would gratify the planter's pocket whilst waiting the result of his silk shipments to Europe.

Carpet Borders.

Some observations that have been made by a correspondent of a foreign contemporary in reference to the slight difference made in design between the body and border of Brussels and Tapestry carpets might well be applied to carpets manufactured in this country. "Is there not room," asks the writer, "for improvement in the matter of 2-4 and 5-8 borders for Body-Brussels and Tapestry carpets? Most of them are composed of figures and colours so precisely like the carpets they are intended to go with as to almost destroy the border effect altogether. On a room thirty feet long the little band on the border that comes next to the carpet is scarcely visible in looking from one end of the room to the other, and the dark band on the outer edge—usually about eight inches wide—is the only real border in the whole thing. A 9-inch border would have almost the same effect. Would it not be a decided improvement to have all wide borders composed of patterns entirely different from the carpets, with a harmony of colours, of course, but sufficiently in contrast to give the full effect of a wide border? If the difficulty was confined to a few borders or a few manufacturers it would be hardly worth mentioning, but nine out of ten of the wide borders are made in the way stated above." We cannot see why this principle of designing borders for carpets should be so strictly carried out. In Tapestry Curtains we seldom, if ever, see a border partaking of the character of the body or filling. The body is of one design, the border and dado are of another (and in many cases dado and border differ) but these are so arranged as to produce an effect in the whole at once pleasing and agreeable. Table covers are also treated in the same manner. We often find a body of a small geometrical pattern with a border of a running character, or the former may consist of sprays of conventional leaves and flowers, whilst the latter may partake of a more set form of ornament. We might mention other classes of designs, such as those for paper hangings, in which, body, dado, frieze and border are all widely different in character. This method of arranging the various component parts of a curtain, table cover, or paper hanging pattern is undoubtedly the proper one, and furnishes an example which might easily be followed with advantage by our carpet manufacturers.

A new American freak in carpeting is the use of Turkish rugs for stair coverings. The rugs are cut in strips and carefully sewed to prevent unravelling. The strips are then laid with no regard for regularity or unity, and the effect upon travelling up and down stairs is pleasing from its very confusion of colour and design. It seems somewhat barbarious to cut up a rug in this way, but if rugs the width of the stair can be obtained, their butchery is obviated.

Hints on Pattern-Designing.

(Continued from Page 65.)

As to the use to be made of these recurring surface patterns, the simpler of them, such as mere stripes and simple diapers, have been, and doubtless will always be, used for external decoration of walls, and also for subsidiary decoration where the scale is large and where historical art plays the chief part. On the other hand, some people may doubt as to what share, if any, the more elaborate forms of pattern work should have in internal wall decoration. True it is that the principle of the continuous line, which led up to all that elaboration, was an invention of the latter East, just as the system of relieving colour from colour was; and I believe the two things are closely connected, and sprang from this cause, that these people were, for various reasons, not much driven towards the higher pictorial art, and did not reach any great excellence in it, therefore they felt a need for developing their pattern art to the highest degree possible, till it became something more than a little-noticed accompaniment to historical art, which was all that it used to be in the ancient or the classical world.

Now as to the pattern-designing for figured-woven stuffs, which is one of the most important branches of the art. Here, as you will find yourself more limited by special material than in the branches above-named, so you will not be so much beset by the dangers of common-place. You cannot choose but make make your flowers weavers' flowers. On the other hand, as the craft is a nobler one than paper-staining or cotton printing, it claims from us a higher and more dignified style of design. Your forms must be clearer and sharper, your drawing more exquisite, your pattern must have more of meaning and history in it—in a word, your design must be more concentrated than in what we have hitherto been considering; yet, again, if you have to risk more, you have some compensation in the fact that you will not be hampered by any necessity for masking the construction of your pattern, both because your stuff is pretty sure to be used falling into folds, and will be wrought in some material that is beautiful in itself, more or less; so that there will be a play of light and shade on it, which will give subordinate incident, and minimise the risk of hardness. Moreover, these last facts about woven stuffs call on you to design in a bolder fashion and on a larger scale than for stiffer and duller-surfaced goods; so we will say that the special qualities needful for a good design for woven stuffs are breadth and boldness, ingenuity and closeness of invention, clear definite detail joined to intricacy of parts, and, finally, a distinct appeal to the imagination by skilful suggestion of delightful pieces of nature.

In saying this about woven stuffs I have been thinking of goods woven by the shuttle in the common loom, which produce recurring patterns; there are, however, two forms of the weavers' craft which are outside these and on which I will say a few words:—1st. The art of tapestry weaving, in which the subjects are so elaborate that, of necessity, it has thrown aside all mechanical aid, and is wrought by the most primitive process of weaving, its loom being a tool rather than a machine. Under these circumstances it would be somewhat of a waste of labour to weave recurring patterns in it, though in less mechanical times it has been done. I have said that you could scarcely bring a whole bush into a room for your wall decoration, but since in this case the mechanical imitations are so few, and the colour obtainable in its materials is so deep, rich and varied, as to be unattainable by anything else than the hand of a good painter in a finished picture, you really may almost turn your wall into a rose hedge or a deep forest, for its material and general capabilities almost compel us to fashioning plane above plane of rich, crisp and varying foliage with bright blossoms, or strange birds showing through the intervals. However, such designs as this must be looked upon as a sort of halting-place on the way to historical art, and may be so infinitely varied that we have not time to dwell upon it.

The second of these offshoots of the weaver's craft is the craft of carpet making, by which I mean the real art, and not the makeshift goods woven purely mechanically. Now this craft, despite its near kinship as to technical matters with tapestry, is very specially a pattern designer's affair. As to designing for it, I must say it is mighty difficult, because from the nature of it we are bound to make our carpet not only a passable piece of colour, but even an exquisite one, and, at the same time we must get enough of form and meaning into it to justify our making it at all in these Western parts of the world; since as to the mere colour we are not likely to beat, and may be well pleased if we equal, an ordinary genuine Eastern specimen.

Once more the necessary limitations of the art will make us, not mar us, if we have courage and skill to face and overcome them. As for a carpet design, it seems quite clear that it should be quite flat, that it should give no more at least than the merest hint of one plane behind another, and this, I take it, not so much for the obvious reason that we don't fell comfortable in walking over what simulates high relief, but rather because in a carpet we specially desire *quality* in material and colour: that is, every little bit of surface must have its own individual beauty of material and colour. Nothing must thrust this necessity out of view in a carpet. Now, if in our coarse, worsted mosaic we make awkward attempts at shading and softening tint into tint, we shall dirty our colour and so degrade our material: our mosaic will look coarse, as it ought never to look; we shall expose our lack of invention, and shall be parties to the making of an expensive piece of goods for no good reason.

Now, the way to get the design flat, and at the same time to make it both refined and effective in colour in a carpet design, is to follow the second kind of relief I told you of, and to surround all or most of your figure by a line of another tint, and to remember while you are doing it that it is done for this end, and not to make your design look neat and trim If this is well done, your piece of colour will look gem-like, and beautiful in themselves, your flowers will be due carpet flowers, and the effect of the whole will be soft and pleasing. But I admit that you will probably have to go to the school of the Eastern designers to attain excellence in the art, as this in its perfection is a speciality of theirs. Now, after all, I am bound to say that when these difficulties are conquered, I, as a Western man and a picture-lover, must still insist on plenty of meaning in your patterns; I must have unmistakeable suggestions of gardens and fields, and strange trees, boughs, and tendrils, or I can't do with your pattern, but must take the first piece of nonsense-work a Kurdish shepherd has woven from tradition and memory; all the more, as even in that there will be some hint of past history.

Since carpets are always bordered cloths, this will be a good place for saying a little on the subject of borders, which will apply somewhat to other kinds of wares. You may take it that there are two kinds of border—one that is merely a finish to a cloth, to keep it from looking frayed out, as it were, and which doesn't attract much notice. Such a border will not vary much from the colour of the cloth it bounds, and will have in its construction much of the elements of the construction of the filling-pattern; though it must be strongly marked enough to fix that filling in its place, so to say. The other kind of border is meant to draw the eye to it more or less, and is sometimes of more importance than the filling; so that it will be markedly different in colour, and as to pattern will rather help out that of the filling by opposing its lines than by running with them. Of these borders, the first, I think, is the fitter when you are using a broad border; the second does best for a narrow one. All borders should be made up of several members, even where they are narrow, or they will look bald and poor, and ruin the whole cloth. This is very important to remember. The turning the corner of a border is a difficult business, and will try your designing skill rudely; but I advise you to face it, and not to stop your border at the corner by a rosette or what not. As a rule, you should make it run on, whereby you will at least earn the praise of trying to do your best.

As to the relative proportion of filling and border: if your filling be important in subject, and your cloth large, especially if it be long, your border is best to be narrow, but bright and sparkling, harder and sharper than the filling, but smaller in its

members ; if, on the contrary, the filling be broken in colour and small in subject, then have a wide border, important in subject, clear and well-defined in drawing, but by no means hard in relief. Remember, on this head, once more, that the bigger your cloth is the narrower in comparison should be your border ; a wide border has a most curious tendency towards making the whole cloth look small. So much, very briefly, about carpet designing and weaving in general ; and, once more, those of you who don't yet know what a pretty pattern is, and who don't care about a pattern, don't be dragooned by custom into having a pattern because it is a pattern, either on your carpets or your curtains, or even your waistcoats. That's the way that you, at present, can help the art of pattern designing.

The Industrial Exhibition at Bradford.

It is now determined that the forthcoming exhibition at the new Technical School, on the occasion of the visit of the Prince and Princess of Wales to Bradford, shall assume very large proportions. Recent experience has shown that the manufacturers and machine-makers of Yorkshire have all the means at hand for producing a most extensive display representative of the several industries ; and it is no longer a question whether the exhibition will be a success, but to what degree that success will be carried. Backed by the public spirit that has already been manifested, more especially among machine-makers, there is no doubt that Bradford will score a complete and unmistakeable triumph in the field of enterprise and skill. Hundreds of applications for space have been received by the exhibition committee, and the difficulty experienced by these gentlemen has been rather to restrain than encourage fresh applications ; while, on the other hand, it will be necessary to exercise very great care in making the selections, in order that each branch of industry may be fairly represented, and none to largely. The work of the jury will thus be simplified, and the award of medals a matter of much less anxiety. The medals to be given by the Clothworkers' Company are offered to designers for the best and most original designs in Bradford fancy dress stuffs. The conditions laid down are :—That the design must be of a floral character, worked out in cotton, silk, and worsted or mohair, or both the latter, and in three colours only. The quantity of silk in warp or weft must not exceed one-fourth of the total length of yarn in warp and weft, and may be used as warp, as weft, or as warp and weft. Where used as warp and weft the proportions are left to the discretion of the designer, provided always that the total quantity does not exceed the maximum specified above. A length of not less than twelve yards must be woven, finished, and sent in not later than the 1st of May next. The fabric woven must be suitable in shade and texture for autumn wear. The intention of the Council in offering such an incentive to designers of Bradford dress goods will doubtless be fully appreciated. A glance at the conditions of the competition will suffice to show that abundant scope is afforded intending competitors for the production of most artistic combinations in colour and material, and a valuable contribution to the forthcoming exhibition may be expected when the competitive designs are exhibited in the form of dress pieces. As the invitation is given to designers, who as a rule are in the employ of private firms, the co-operation of employers will be generally desirable in order that the needful assistance in working out the design may not be withheld. The competitors may register their designs before exhibiting. The medals to be offered by the exhibition authorities, and by other bodies closely interested, will, we are led to believe, be quite worthy the occasion ; and it may be here remarked, in the interests of the exhibition, that too many medals cannot be given, inasmuch as it depends, to a large extent, upon the possibility of obtaining a prize or recognition whether many will incur the great expense of preparing for a really worthy display of their goods. The accommodation for the exhibition of Leeds, Bradford and Huddersfield stuff goods is very considerable, and we are informed that in this section the executive have no fear of being overtaxed with exhibits ; but with regard to machinery matters stand in a different position, and we may say that an annexe of many thousand square feet in extent will have to be erected in order to meet the requirements of intending exhibitors. It will therefore be necessary for the proper authorities to set to work at once in an energetic manner, so that everything may be done which human forethought can devise towards making an exhibition which will surpass for splendour, utility, and completeness, anything ever held outside a capital.

SCIENTIFIC AND ART NOTES.

The Yorkshire Fine Art Society, notwithstanding the failure of the last exhibition, have bravely determined to hold a spring artists' exhibition as usual. The loss is about £1,500 ; and the guaranteers will have to pay, or have already paid, 6s. 8d. in the pound of the sums they guaranteed.

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Some idea of the interest in the technicalities of the various industries may be gathered from the fact that Austria alone supports 1,000 technical schools, Italy between 300 and 400, Bavaria 1,600 for girls, Holland 32, Germany a large number, and so on with other European countries.

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Mr. J. E. Hodgson, R.A., has been for some months engaged on a series of designs to be produced in tapestry for the decorations to be produced in tapestry for the decoration of the mansion of Mr. C. Vanderbilt in New York. The subjects are modern, and represent English sporting scenes of the present day.

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The Milan Exhibition cost, according to the *Monitore Industriale*, £130,000, while the admissions produced £154,000, thus leaving £24,000 profit, £22,000 of which has been returned to the subscribers. This success has led to another Exhibition being projected at Bielha, to open in the summer, when the Alpine Congress is held.

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The opening of the Lille Exhibition is deferred until the 1st April, and goods will be received at the Palais Rameau up to the 15th March. Foreign exhibitors or their representatives must fulfil the Customs' formalities on the receipt and re-forwarding of their cases, the opening of which will take place as far as possible, inside the palace.

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In connection with the fifth annual Dundee fine art exhibition recently closed, sales were made to the amount of £5,407 ; an increase of £500 over those of the previous exhibition in 1880. The sum realised for admissions was £1,222 : an increase of £250 over the previous year. In proportion to the population, the sales are believed to be the highest yet reached by any exhibition in Great Britain.

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The Paris electric exhibition, according to a report just presented by M. Cochery, had 1,764 exhibitors, viz., France 937, Germany 148, Austria 36, Belgium 281, Denmark 5, Spain 23, England 122, Hungary 10, Italy 81, Japan 2, Norway 19, Netherlands 18, Russia 38, Sweden 23, Switzerland 21. The admissions by payment numbered 673.473, and the free admissions to schools, workshops, &c., were very numerous, the last two free days having 80,000 visitors. The receipts, including 200,000f. from the State and 25,000f. from the Municipality, amounting to 1,048,417f. The expenses already paid reach 689,490f., and after clearing off a few outstanding bills the net surplus is expected to be 325,000f.

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A beautiful golden-yellow dye is now prepared from the young wood of various poplars. The young branches and shoots are cut off, crushed and brayed, and then boiled in alum water in the proportions of ten pounds of wood and one pound of powdered alum to three gallons of water. The liquor is boiled from twenty minutes to half-an-hour, and then filtered. In cooling it thickens and clears, throwing down a greenish-yellow deposit of resinous matter. When sufficiently clear the liquid is again filtered, then left exposed to the air for three or more days, according to the weather and the atmosphere. It quickly oxidises under the action of light and air, and assumes a rich golden tint, and in this state can be used for dyeing fabrics of all descriptions. For yellow and orange-yellow shades it is used alone ; mixed with Prussian blue it gives green ; with oak bark, brown and tan ; with cochineal, &c., orange and scarlet shades. The colouring thus produced is said to be of superior quality.

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A cheap system of working the electrict light is being tried in a tentative form at Lyons, and has a promise of a wide application when a little more experience as to the best machines, lamps, &c., has been gained. M. Lartet. of Lyons, is using the current of the Rhone to drive a number of water-wheels, which are employed to supply power to electrical machines for lighting the house of one of the learned societies in the city mentioned. It will be observed that it is the " current " of the river which is used, Lyons being above the tidal influence, and the thought will naturally occur that a similar experiment might be tried on the Thames. Above Teddington the river always runs in one direction, and it is a very dry season when the water is too low to work a wheel. At present the available power of the river runs to waste over the weirs, but with the aid of storage batteries, a dynamo machine, and a few water-wheels, there seems to be no reason why some of the small up-river towns should not supply themselves with the electric light at a very cheap rate.

ORIGINAL DESIGNS.

Our first plate is a design in Louis Seize style of ornament, and is drawn for a Tapestry fabric. In colouring this pattern the ground is intended to be Black; the scroll in Pale Blue and Gold; the flowers Crimson; and the leaves Light Sage Green. This design is drawn by Mr. R. Lord, Halifax.

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Our second design, also by Mr. R. Lord, is intended as a suggestion for a Cretonne. It would be difficult to properly describe a colour scheme for this pattern, as in fabrics of this class there is such a wide scope for artistic effects. As the basis of a colouring we might suggest the use of a Slate ground: Sage Green, Silver Grey, and Fawn; which, with the introduction of two or three brighter shades, such as Crimson, would produce a good effect

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Our third design is drawn by Mr. Ezra Hoyle, of Bradford, from a sprig of the plant Calitrichæ vernalis. Patterns of this class are adaptable to many purposes. This is, however, intended for a fancy figured fabric.

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*** We beg to inform manufacturers and others that adaptations of designs, published in the "Journal of Fabrics," can be made at the Office by experienced Designers, and that Original Designs can also be furnished at moderate charges.

MONTHLY TRADE REPORTS.

Wool.—The wool trade during the past month has been characterised by a quietness in nearly all classes. The London sales up to the present time has been well attended, and this coupled with the fact that the wool offered has been of a good selection, has caused operations to be carried on rather freely, and prices have consequently been firm, with a tendency to rise in some sorts. In Edinburgh and Glasgow extreme quietness prevailed during the whole of February, although without any fall in prices. At Bristol Wool Fair there was a large attendance of buyers, and a considerable business was done at firm rates. In Bradford trade has been of a very dragging nature during the whole of the month, and prices have been barely maintained, after receipt of favourable news from Bristol fair, a more hopeful feeling prevailed in the market. To Halifax the same remarks may be applied as to Bradford. In Leeds, Huddersfield, Batley, and Dewsbury, a fair business was done at the beginning of the month, which fell off somewhat, buyers preferring to see the result of the London sales before purchasing extensively. The Yarn and Piece trade has been of a slow character, a few orders have been given out, but at very low rates; prices must be quoted lower, with a slack demand for goods.

Cotton.—The cotton trade has during the month been in a very unsatisfactory condition for the manufactured articles; the prices prevailing do not afford any margin for profit, when taking into account the cost of the raw material. Business in Yarns and Cloth has been dull all round. Perhaps a little more has been done in the Eastern markets, but for other countries the demand has been meagre. A meeting of manufacturers was called to consider the state of things, and to propose a remedy, a general resort to short time was suggested, and is being acted upon by nearly all the firms in the Lancashire district.

Woollen.—The trade continues fairly active in all departments, manufacturers of low-priced goods, and those engaged in fancy makes, are fully employed. The shipping trade with France has been brisk for obvious reasons. In the heavy woollen districts some firms are very busy in making a lighter class of fabrics than is usual with them. Prices are firm on the whole.

Silk.—The market is quiet, little having been done since the public sales, but holders generally are firm, especially for China silk, and look hopefully on the future. Japan silk seem for the moment to be waiting for a nearer approach to the exhaustion of the stocks of European silks, the use of which is favoured by the present make of goods.

Linen.—The trade is rather quiet, but prices during the month have slightly improved. In Yarns, business both for home and export account is of a limited description; current productions of common yarns is not taken off. In the manufactured article a fair business is passing for all kinds, and prices are for some sorts higher, and for others the tendency is upwards.

Carpets.—The carpet trade is in a healthy state, orders for different classes have come in freely, and at fairly remunerative prices. The only drawback to the trade seems to be in the dissatisfaction shown by the weavers at the wages they are receiving. The matter has, however, been referred to an arbitrator, who will no doubt adjust the difference amicably to the masters and men.

Lace.—Considerable activity yet pervades the lace trade, all descriptions being in favour, the demand being especially brisk for almost all kinds of cotton fancy trimmings. The curtain department remains active. Silk and other nets meet with a fair demand. Prices keep firm, with a slight tendency upwards.

A New Drapery and Carpet Fabric.

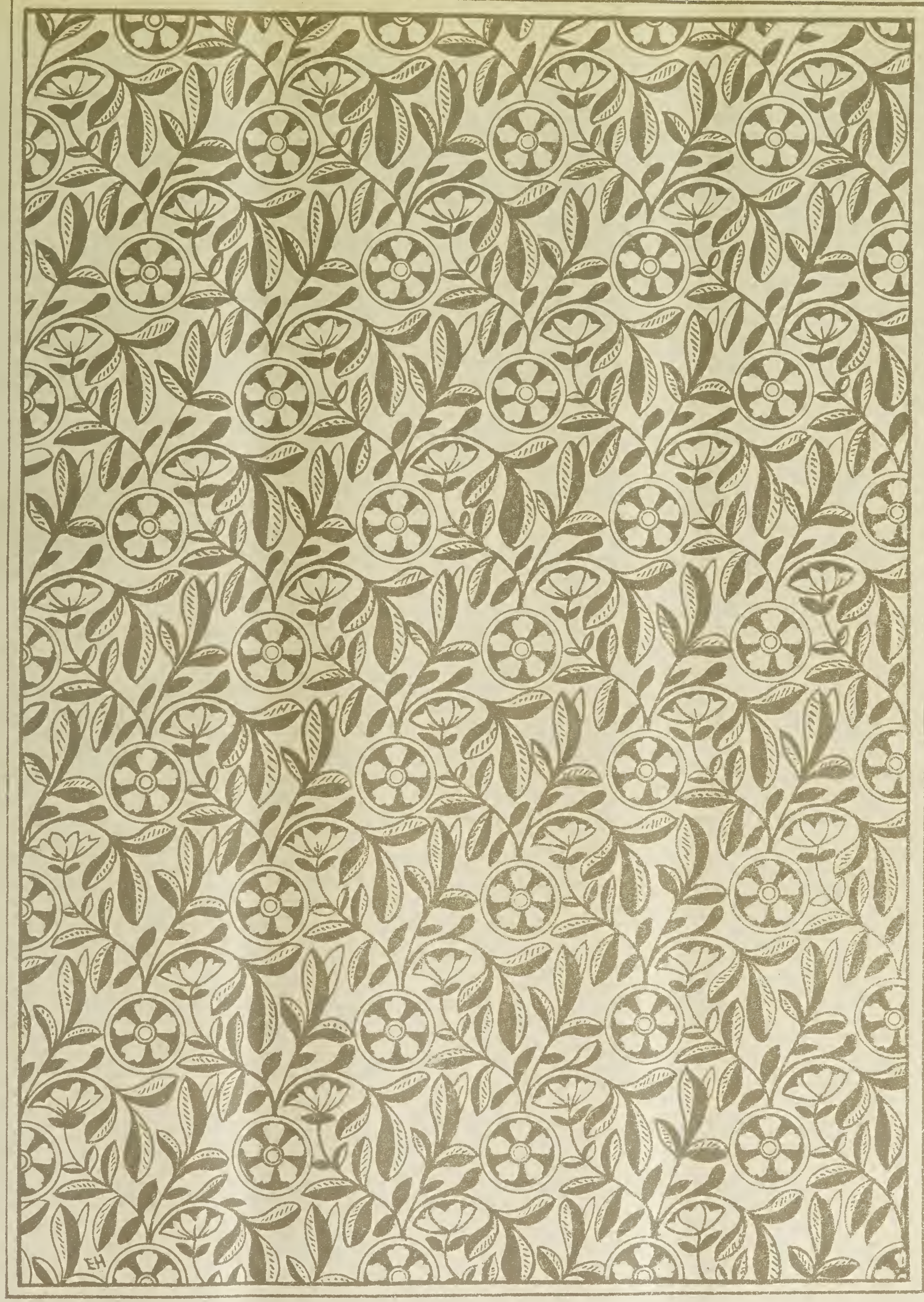
Persons of taste, says the *Art Amateur*, whose purses are not long enough to enable them to buy the more expensive fabrics for draperies, will be glad to know that a new material called "Silk Turcomans," excellent for this purpose, has recently been put upon the market at prices which are moderate considering the durability and artistic merit of the goods. The material is raw silk, and is somewhat of the order of a plush, consisting of closely-woven strands of chenille crossed by a strong thread warp. A hand-loom is used in the manufacture, and the colour in the design is woven into the fabric, both sides being alike. The decoration of the drapery is generally in broad horizontal stripes. Oriental motives being chiefly employed. The material being soft and yielding, hangs in broad, handsome folds. The manufacturers produce in great variety rugs and carpets of similar character as to colour and design, wool being used instead of raw silk. Like the drapery, these goods are reversible. They are rich in appearance, and in colour and design have some of the best features of Oriental rugs.

Public Designers.

A contemporary speaking of designers connected with the print trade in years gone by says:—"Then a designer of first-class abilities was satisfied if he had a permanent engagement with, and his services were confined to, one good firm; now the best designers in Paris, not content with this plan, as of old, make the selling of their designs a regular business, and dispose of them to any printer or manufacturer who may call on them and choose to buy." It might have been added, that French designers are not content to sell to any manufacturer "who may call on them," but that they wait upon manufacturers precisely in the same manner as any other traveller does with his merchandise. They do not confine themselves to one class of designing, but do a large business in carpets, tapestries, linens, &c. The first of our English designers have far beyond our recollection employed this method of working. We might here mention the names of many who have earned for themselves a world wide reputation and who had they been content to remain as designers for any special firm instead of turning public designers, would still have been in comparative obscurity.

The *Electrician* says that news from the West Indies reports the recent introduction of a sixpenny telegram system into British Guiana as a success, the messages being nearly three-and-a-half times as many as during the time that the minimum charge was one shilling.

DESIGNED BY EZRA HOYLE.



The British Woollen Industry.

In a recent issue of the *Times* appeared a letter written by Mr. G. Baden Powell of St. George's Place, Hyde Park Corner, containing a valuable statement of facts which cannot fail to be interesting to manufacturers generally. The letter ran as follows:—

Public opinion regards with surprise the arguments formulated at the Mansion House by the leaders in this movement for the encouragement of the British Woollen industries. We are all of us eager to see those industries again in a state of glowing prosperity; but no good can come of any attempt to assist these industries with support based on conclusions and on premises inconsistent with actual facts.

I would ask leave to refer especially to two leading points in these arguments. It was assumed, on the one hand, that the English manufacturer had been grievously defeated by the foreign manufacturer in league with fashion; and it was also assumed that this had been one great cause of agricultural depression.

At this meeting at the Mansion House it was explicitly stated by the speakers, with the tacit acquiescence of the audience, that the English woollen trade was being overwhelmed by foreign competition, and that that mysterious despot Fashion marshalled and directed this new invasion. The leaders of the movement that is to oppose this conjectual invasion seem content to depend on mere allegations, and to be presumably not aware of the figures of their own trade. They may, therefore, be interested to know that transactions were as follows in the year 1880:—Of woollen manufactures, in round numbers of value, we made and consumed in England £63,000,000; we made and exported from England £17,000,000; and we imported and consumed from abroad £7,000,000.

In other words, Fashion, marshalling to her support all the varieties and exceilencies of foreign endeavour and skill, manages to supply us with one-tenth only of what we annually consume in woollen manufactures; and on the other hand, we supply foreigners with nearly three times the value of woollen manufactures that we obtain from them. The foreigner must be mightily unfashionable; and it seems that his eagerness to possess himself of goods that are pronounced at the Mansion House to be unfashionable enables the ladies of England, out of the profits of the trade, to wear whatever they may consider most suitable to their position, their person, or their purse

It may also be interesting to the leaders of this new movement to know that we are year by year using more and more "raw" wool in England. The following figures testify to this:

	1870. lb.	1875. lb.	1880. lb.
1. Of foreign wools we imported ..	263,300,000	365,100,000	463,500,000
2. Of foreign wools we exported ..	92,500,000	171,100,000	237,400,000
Of foreign wools we retained for use	170,800,000	193,000,000	226,100,000

It is also to be remembered that as a nation we are taking from foreigners more and more yarn for weaving and other manufacturing purposes. The figures are:

	1870. lb.	1875. lb.	1880. lb.
Yarns exported ..	35,500,000	31,700,000	26,500,000
Yarns imported ..	10,300,000	12,400,000	14,900,000
Excess of exports ..	25,200,000	19,300,000	11,600,000

In other words, so far as the foreign trade in yarns is concerned, we are supplying less and less to foreigners, and taking more and more from them: and, as yarns are only used for manufacture, these facts do not exactly prove that foreigners are manufacturing more and we manufacturing less.

I would allude briefly to the other point—the alleged effects on British agriculture Here, again, it is often better to know what is actually proceeding than to ignore such knowledge, and allow the kindly impulse of generosity to be led astray by the imagination. It seems to have been tacitly assumed that both prices and quantity of English-grown wool have fallen solely because fashion as for the time being deserted lustre and long wool for dulness and short wool. But the magnitude of this asserted influence is limited by the fact that of the 150 millions lbs. of wool annually grown in these islands, 55 millions at the least are short wool. And, again, those familiar with agriculture know very well that for years past farmers have bred for the carcase and not for the fleece; they have found it more profitable ever since the beginning of the century to supply the butcher rather than the manufacturer; and the consequent fall in the value of the fleece has been more than compensated by the increased bulk and general character of the carcase; and meat is one of the few commodities that seems always to remain high in price. The number of sheep in England varies but little taking one year with another. The averages for the last four triennial periods have been—32½ 33½ 32½, and 31½ millions. The figures always fall off in wet years. Fluke and other diseases incidental to excessive moisture are known to have almost decimated flocks in certain districts of late. The fashion for these dull wools, on the showing of the authors of this new movement, did not enter upon the scene till 1874. But in 1868 there were 35 millions of sheep in these islands, and in 1871 only 31 millions, in spite of the absence of all interference on the part of fashion. It is also worth while noting that the increase has been continuous in the export of English-grown wool, from 9,000,000lbs, in 1870 to 11,000,000lbs. in 1875 and 17,000,000lbs. in 1880. Foreigners are taking more and more of our home-grown wool. The results on fashion may be disastrous, but we have no cause to complain.

When we meet with an appeal to English ladies to employ English labour in preference to foreign we find ourselves face to face with an appeal altogether out of tune with the intelligence and the tendency of the times. If education has achieved anything. English women will know they cannot spend a penny on French or any other fashions, unless the penny has been earned first; English labour provides the English nation with the wherewithal for these foreign purchases.

On this question of fashion the ladies of England will do well to follow the "statesmanlike" lead of Her Royal Highness the Princess of Wales, and not be led astray to imagine that by purchasing what they do not want they can in any way assist those whose economic function it is to supply what is wanted. British industries, as a rule, are quite capable of taking care of themselves; they require no patronising, and least of all would they brook any grandmotherly protection for foreign competition. England manufactures nearly one-third of the wool that is manufactured in all Europe. The English system is doubtless capable of improvement, but it is not trembling in its shoes because the general prosperity enables the nation to make a few purchases abroad. As long as we in England wisely and determinedly allow as little as possible to interfere with the free course of industrial transactions fashions can but assist in giving spice and stimulous to industrial exertions.

To attempt to fight natural tendencies is a beating of the air that is vain, if it be not indeed actively injurious to the interests involved. And it is a fight which the wise will wage only when they are ignorant. A generous but perblind imagination has before now led good people to lay the lance in rest, even against innocent windmills.

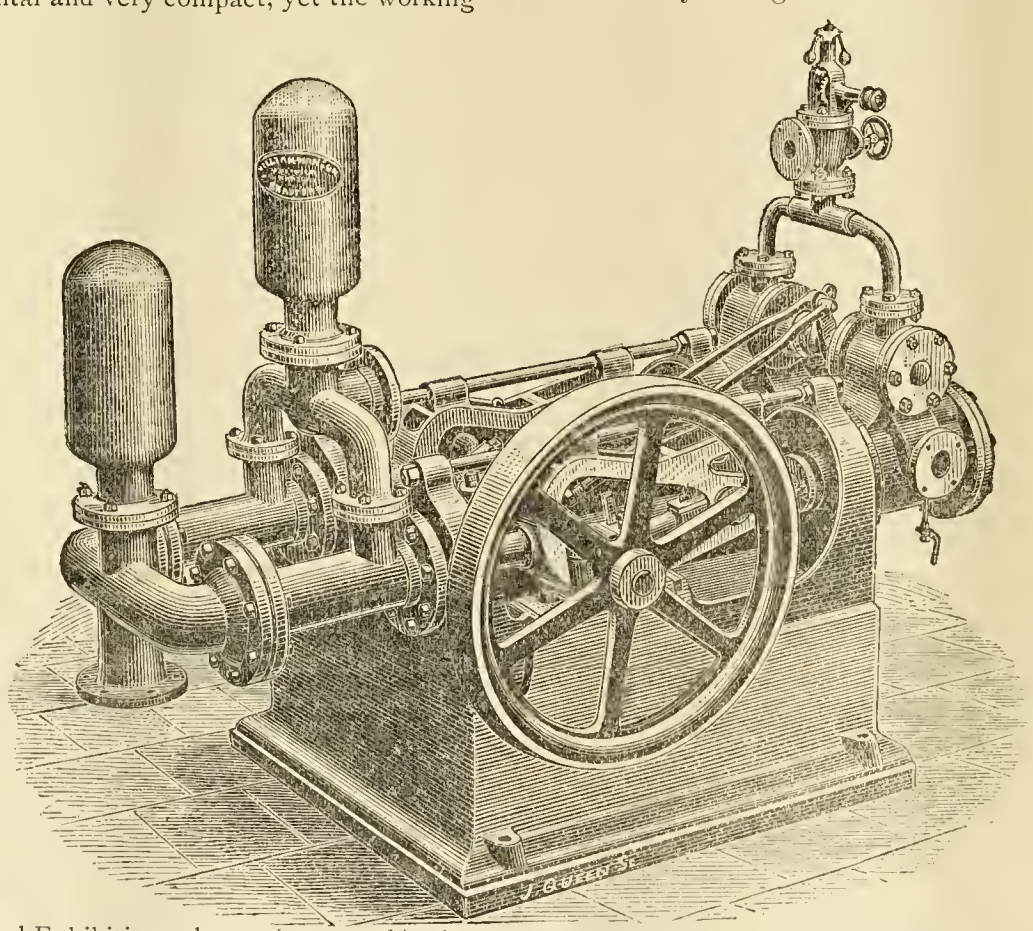
Oil Cream in the Carding and Combing of Wools.

In the carding and combing of wools it is a well-known fact, that extra care taken in selecting oils for use in the working, amply repays the consumer for his trouble. Special attention has been paid by many oil-producing firms, in ascertaining the qualities of oil most suitable for the above purpose, and they have contributed materially to the advancement of this department of the trade. A short time ago we had submitted to us some samples of Oil Cream, made by Messrs. Parr and Co., of Bradford, which have been tested with very satisfactory results. Its efficiency in softening and cleansing, and giving a fuller and richer feeling to wool is very marked, the wool afterwards being more easily and thoroughly washed, and taking a brighter dye. It has no disagreeable odour, as have many oils—on the contrary, even when heated the smell is very slight but pleasant, and in the hottest weather its peculiar properties prevent it from reecing. It is impossible to burn any material saturated with it, the oil being incombustible. We may add that by its use 30 per cent. is saved on the price of olive oils, besides giving improved results in the working.

MACHINERY, TOOLS, ETC.

Hanson's Steam Pump.

Our attention has been drawn to a new Improved Steam Pump at present being made by Mr. R. Hanson of Quebec Works, Thornton Road, Bradford, who, as a practical engineer, has had considerable experience in the designing and manufacturing of such specialities. As will be seen from the annexed illustration the Pump is made horizontal and very compact, yet the working parts are very firm, being fixed to a cast iron bed, and so arranged that in case of repairs, any part may be reached without any difficulty. The glands are all either made of brass or are lined with that metal, and the suction valves are made large enough to ensure the Pump giving satisfactory results. This matter is too often neglected in the manufacture of pumps. In the event of any leakage from the stuffing boxes, the water by a simple arrangement is caught and drained away. It is especially adapted for Steam Fire Engines, the buckets being lined with brass, and the working parts of the same materials. The steam cylinders are made of such a capacity that in case the pressure of steam should fall as low as 20 lbs., the Pump will work and give a pressure of 90 lbs. per square inch on the hose-pipe, which is we think a very satisfactory result, and being as great as the best hose-pipes should be subjected to, when in regular use. Mr. Hanson guarantees the Pumps to give a stream of water as regular and steady as the town's mains.



As an ordinary Pump for pumping water, it ranks with any yet in the market, in respect to efficiency. We should strongly recommend visitors to the ensuing Bradford Technical Exhibition, who are interested in the making and purchasing of such specialities to make a point of visiting the Quebec Works and examining the Pumps. We are sure they will be gainers by so doing.

Electricity as a Motive Power.

The development of electricity as a motive power is an aim which, though difficult of realisation is yet strongly to be desired. Its achievement is not, however, so very far off, if we may take the utterances of some of the best authorities on the subject as conclusive evidence of the probabilities of the future. For example, M. Bontonx, presiding last week at a meeting of the Parisian Society for the Utilization of Electric Force, observed that the artisan who needs a little motive power for his work is forced to seek it in the employer's factory, while thousands of workmen and workwomen wear out their bodies and destroy their strength in impelling the sewing machine, the lathe, and the other motive powers of small industry. The division of electric energy is destined to effect an entire revolution in this sphere. The day will come, and sooner than is imagined, when the artisan family will see enter their dwelling by means of a magic wire the force which is now so costly to them, and this will be the democratization of force for the benefit of the working class. The solution of the question of motive in mechanical industries is by this apparently not far distant, and it is curious to contemplate the changes in our social and public arrangements which such a development of the electric motor would accomplish. If an efficient, actuating agent for small machines of every kind could be readily obtained and cheaply purchased, what a revolution would come over the existing labor market? How many workshops for men and workrooms for women would be closed, the quondam employés being supplied in their homes with the means of carrying on their work in their own apartments. Without attempting to foreshadow all that might happen, certain it is that the cost of driving lathes and machines of every kind would be largely diminished, and the means and motive for extending their application supplied. From all points of view it is much to be wished that this novel mode of actuating machinery may be developed so that its efficiency and economy may establish a reputation, and be largely patronised by both large and small employers of labour.—*Building and Engineering Times.*

The Wool Trade of Italy.

The manufacture of wool, which at one time formed a source of wealth to the Italian Republics, was introduced in early times into this country, and in comparison with other industries has already maintained in some provinces a certain degree of importance. The merino sheep imported at one time into Italy, have almost entirely disappeared, but several native breeds yield wool better adapted for modern products and in greater quantity than that furnished by the merinos As regards the production of wool, Italy may be divided into two parts. 1. Piedmont, Lombardy, Venetia, Emilia, and a large portion of Tuscany, in which regions sheep-breeding may be considered as accessory to agriculture. 2. The Tuscan, Maremma, Latium, Umbria, the Neapolitan provinces and the Islands, where the breeding of sheep forms an industry nearly independent of agriculture, and having for its principal object the production of wool. According to the cattle returns published by the Ministry of Agriculture, Italy contains 6,977,104 head of sheep; estimating at 1 2-5 kilo. the quantity of wool furnished by each sheep after washing, the average gross produce of the whole country would be 10,000,000 kilos., which would yield in washed and cleaned wool 7,000,000 kilos., or deducting the average exportation of late years, amounting to 800,000 kilos. per annum, the quantity of washed and cleaned native wool available in Italy would slightly exceed 6,000,000 kilos. To this must be added the imports of wool from abroad, which, when washed and cleaned, may be estimated as furnishing 4,000,000 kilos. to the factories, and the shoddy *(lana meccanic)*, the production of which ten years ago was calculated by Senator Rossi to be 4,500,000 kilos, and which must now be over 5,000,000 kilos. Altogether, therefore, some 15,000,000 kilos. of wool remain in Italy, nearly the whole at the disposal of the manufacturers.

The French Tariffs.

The following statement, compiled by the Central News, shows, the duties on important articles of British exports under the Anglo-French Treaty of 1860, the general tariff adopted by France in 1881, and under the new Belgian Treaty, which will govern the duties now payable on British exports to France:— The majority of Cotton and Woollen Fabrics paid under the Commercial Treaty of 1860 10 or 15 per cent *ad valorem*. The additional duty imposed upon the French general tariff of 1881 is about 24 per cent in the lowest numbers and varies from 50 to 100 per cent in the highest numbers. Under the new Commercial Treaty with Belgium a considerable modification is made. In the third and fourth classes of unbleached yarns three kinds will pay more and twelve kinds will pay less than formerly. Under the general tariff of 1881 the duties on the lighter cotton fabrics were doubled. The Belgian cotton manufacturers demanded the withdrawal of this advance and the return to the old duties of the 1861 treaty. This they succeeded in obtaining, and its effect may be seen in one or two instances. Cotton of from 21 to 27 threads would pay under the Commercial Treaty of 1860 80 francs per 100 kilogrammes, under the new French general tariff 230 francs, and under the Belgian Treaty of 1881 148 francs. Cotton fabrics of from 28 to 35 threads would pay under the Treaty of 1860 120 francs, under the French

general tariff 300 francs, under the Belgian Treaty 193 francs. Cotton, 36 to 43 threads, would pay under the Treaty of 1860 190 francs, French general tariff 410, Belgian Treaty 270. Cotton, 44 threads or more, would pay under the 1860 Treaty 300 francs, general French tariff 625 francs, Belgian Treaty 403 francs. In regard to Woollen Yarns, the French refused to yield to the Belgian objection to the new distinction between combed and carded yarns. In combed yarns the increase under the general tariff in almost all cases is about 24 per cent on the Treaty of 1860, but carded yarns, while showing some decrease in many instances, were increased nearly 90 per cent. The minute subdivision of the classes makes it difficult to summarise the alterations, but the main changes introduced under this head by the Belgian Treaty are that, whereas under the general French tariff the duties on carded wool vary from 18½ francs for the lowest class to 56 francs for the highest, the Belgian Treaty fixes the duties at gradations extending from 12 francs to 36 francs. Woollen fabrics of all varieties have under the Treaty of 1860 paid an *ad valorem* duty of 10 per cent. The new general French tariff alters this into a system of specific duties, under which drapery, broadcloth, merino, cachemire, &c., were subjected to the same taxes according to weight per square yard, the rate being 211, 186, and 161 francs per 100 kilogrammes. These taxes are reduced in the Belgian Treaty to 140, 123, and 106 francs respectively. For lighter stuffs these duties represent about the same rate of 10 per cent *ad valorem*, but for the commoner qualities they amount to a duty of 12, 15, and even 18 per cent. In Carpets the rate under the Belgian Treaty is much the same as the 10 per cent rate under the Treaty of 1860. Plaid shawls at low prices have become an important article of trade in Paris. These are placed under a special category in the Belgian Treaty. In pure wool, or mixed with cotton in the proportion of 25 per cent or less, they will pay a duty of 115 francs per 100 kilogrammes, provided they weigh from 200 to 300 grammes the square yard, and those which are about half cotton will pay 80 francs. The Belgian Treaty contains some important clauses.

Article 4. Says the contracting parties can in place of Customs duties impose on foreign merchandise a supplementary tax equivalent to the excise duties, or the tax on consumption imposed on similar native articles.

Article 6. Merchandise of all kinds originating in one of the two countries, and imported into the other, cannot be subjected to duties of excise or consumption higher than those imposed on similar articles of national production.

Article 18. No reduction of duties will be incurred by deterioration of merchandise imported.

Article 20. The importer of machines and mechanical contrivances in parts is not bound to produce a model at the Customs office.

Article 25. The two contracting parties undertake to let each other profit to the fullest extent by any reduction in tariffs accorded to a third nation. They will not establish towards each other any prohibition not applicable to other nations.

Article 27. The Treaty remains in force until February 1st, 1892.

A New Metallic Cloth.

A new material is about to be put upon the market, in the shape of a metallic cloth. An invention has recently been patented for the production of this cloth, which if desired can be impressed with a pattern, or printed upon. The mode of manufacturing the material is as follows:—The metal intended to be used is rendered into small particles, short or long according to requirements, and is then mixed with a sticky material such as India-rubber; this mixture is transferred to a fabric made from cotton, wool, linen, silk, or other textile material; the fabric is then dried and calendered or pressed in any suitable manner so as to produce a smooth metallic face. After this preparation the cloth can be impressed with a desired pattern by the process of embossing; or the pattern may be printed on its surface in the usual manner. The cloth produced as above, when finished, is soft to the touch, and is very pliable. The liquid charged with the metal does not penetrate to the under side of the fabric, but leaves it quite clean.

The Partnerships Bill.

In a Bill brought in by Mr. Monk, M.P., it is proposed to introduce a system of limited partnerships corresponding to the continental *sociétés en commandite* and the special or limited partnerships authorised by statute in most of the United States. One of the objects of the bill is to do away with the system of loans for a share of profits, as now practised or attempted under the Act of 1865. Mr. Monk also advocates the introduction of a general system of registration of firms. Under this scheme no registration would be required if the firm-name consists of the full usual names of all the partners or acting partners without any addition. Thus the name of a dormant partner need not appear as long as the firm-name is composed solely of real names of existing partners. But if a firm register at all, it must register fully, and limited partnerships, and those whose firm-name contains anything beyond names of actual partners, must always register. The particulars which the scheme requires to be registered are—(1) The firm-name; (2) the nature of the business; (3) the places of the business; (4) the full name, usual residence, and other occupation (if any) of the partners; and (5) in case of the future commencement of a new business, or establishment of a new place of business, the date of such commencement or establishment. The Bill embodying these proposals also consolidates the existing law relating to partnerships, with the exception of the part that more properly belongs to bankruptcy.

ODDS AND ENDS.

A New York correspondent writes that the United States Consul in Manchester has made a careful report upon the alleged frauds in the packing of American cotton, and says that the charges are true. The instances in which weight has been increased by putting sand and water into the bales were, he declares, most shameful and humiliating.

* * * *

Mr. Ney Elias, British Joint Commissioner at Leh, has sent to India a sample of Russian cloth which is now extensively sold and used in Yarkand. He says it is certainly better than any cloth of British manufacture received in Leh, and adds that the cloths received in Leh from the Punjab are yearly becoming inferior in quality, and will be driven out of the Central Asian market altogether in a few years.

* * * *

The new woollen factory being built by Messrs. Guinness at King's Bridge, Dublin, is making rapid progress. It was commenced in November last and it is expected to be finished in June next. The dimensions are 300 feet long by 212 feet wide, and 20 feet high. The roof will be supported by iron girders resting on pillars 15½ ft. high. The hands expected to be employed will number between 700 and 800.

* * * *

"Nottingham" lace is now largely made in Scotland. A factory for the purpose was erected in Ayr a year ago, and a correspondent of the *Labour News* states that the preliminaries for the erection of a second and larger establishment are now in progress. The present manufactory is the property of a Glasgow firm, and has been kept regularly at work since it was opened. The new factory is said to be in the interest of a Nottingham firm.

* * * *

Forty years ago a Frenchman, with the usual practical views of the nationality, conceived a happy idea for easily creating intricate designs upon plush. This happy idea was simply the application of a hot iron to the surface of the goods. The discovery was made in an accidental way, and cost him the good looks of a velvet dressing-gown which his over-zealous wife had attempted to iron. His experience, however, suggested what was afterward, and is still called embossed plush.

* * * *

The novelty of a sale of Egyptian jute took place last month in the Dundee Public Warehouse. The jute, of which there was about 13 tons, was divided into twenty-five lots There were three lots of Sanieh jute. One of these, weighing 9cwt. 3qrs. 14lbs., sold for £15 5s.; another, weighing 9cwt. 3qrs. 16lbs., sold for £16; and the third, 6cwt. 1qr. 12lb., brought £16 7s. 6d. The remainder of the lots sold at from £14 to £15 7s, 6d. each, the weights of the different lots ranging from 4cwt. to 12cwt.

* * * *

The conditions of the new commercial treaty just concluded with France are much more favourable for Switzerland than was at one time expected. For textile fabrics, with the exception of very fine cotton goods, the *status quo* is maintained; for silks, woollens, printed cottons, and straw ware satisfactory terms have been obtained, On a few articles only have the old duties been raised. Switzerland, on the other hand, has increased the tariff on wines and spirits to an extent that will add some 2,000,000f. a year to the Federal revenue.

We are glad to learn that the ingenious carpet measuring machine, invented by the late B. K. Palmer, is likely to come into general use. This useful contrivance consists of two arms or rods, extending horizontally from a vertical rod, which is inserted into the end of a roll of carpeting, and is made to revolve, thus causing a circle to be described by the two arms, on the one of which a sliding finger or peg follows the selvedge of the carpet, while an indicator on the other arms records the distance travelled by the finger, so that carpeting may be easily and accurately measured without opening the roll.

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An Exhibition of Industrial and Agricultural Products, Industrial and Ancient Art, is to be opened at Bordeaux, on 1st June next, under the auspices of the Philomathic Society, with the concurrence of the Government, the Municipality, and Chamber of Commerce of Bordeaux. The Exhibition is limited to the productions of France and her colonies, Spain and Portugal. Special buildings will be erected in the middle of the town, on the Esplanade des Quinconces; and motive power will be provided gratuitously. Diplomas of honour, gold, silver, and bronze medals, and honourable mentions will be awarded by an international jury.

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The new reply post card is an adaptation of the German pattern. It consists simply of a double card folded longitudinally, the reverse side being available for reply. It possesses the advantage that, if it is not preaddressed by the sender, it is available for use as an ordinary post-card. The alternative pattern which, after prolonged consideration, has been rejected by the postal authorities, consists of an ordinary card with a double stamp and ruled spaces on the face for the address and the reply address. On the back is gummed at the edge a thin piece of paper on which the sender writes what he has to say. In replying, this thin piece of covering paper is torn off, and the answer written on the clean surface beneath. As in this case the card is only available for reply to the original sender, the plan adopted by the Post-office, although possibly less advantageous to the revenue, will be more appreciated by the public.

THE GAZETTE.

Adjudications of Bankruptcy.

Radley George, trading as Radley and Co., Horsforth, Yorks, manufacturer.

Liquidations by Arrangement or Composition.

Beresford Henry and William Beresford, Macclesfield, cotton spinners.

Haigh William, trading William Haigh and Co., South Street, and Queen Street South, both Huddersfield, cotton waste dealer.

Hinchliffe George, trading as George Hinchliffe and Co., Lockwood Road and Market Street, both Huddersfield, woollen cloth manufacturer.

Middlebrook Tom, Wellington Bridge and Westfield Road, both Leeds, woollen manufacturer.

Whiteley Samuel, Calder Vale Mill, Birds Royd, Rastrick, Halifax, woollen manufacturer.

Thomlinson John, Ashbridge, trading as J. A. Thomlinson and Co., 10, Cavendish Place and Nelson Street, both Carlisle, woollen, cotton, and mixed goods manufacturer.

Waite Benjamin, Farsley and Stanningley, Calverley and Leeds, and Aire-street, Leeds, woollen cloth manufacturer and merchant.

Yates John, Lees, near Manchester, cotton spinner.

Gledhill John, Golcar, and Park Wood Mills. Longwood, both Huddersfield, woollen cloth manufacturer.

Patrick Ellis, trading as Patrick and Co., Wellington Street, Leeds, woollen merchant.

Ingham Richard, Sowerby Bridge, Yorks, cloth finisher.

Cooper William, Halifax, woolstapler.

Hinchcliffe Edward, Back Granville Street, Dewsbury, woollen spinner.

Taylor James, trading as James Taylor and Co., Milnrow, near Rochdale, flannel manufacturer and hosier.

Sequestrations.

M'Arthur Bros., and John M'Arthur, sen., and Thomas M'Arthur, woollen manufacturers, and William M'Arthur, manufacturer, fruiterer, and confectioner, all of Alva, the partners and as individuals.

Trustees Appointed.

Butler Joseph W. (Liquidation), Ashton-under-Lyne, cotton spinner. Trustee, G. A. Robinson, 10, St. James's Square, Manchester, accountant.

Washington George and Isaac S. Washington, trading as Washington Bros. (Liquidation), Halifax, wool dealers. Trustee, J. Crowther, Elland, wool dealer.

Ford William J. and James King (Liquidation), Leicester, hosiery manufacturers. Trustee, R. S. Mantle, Leicester, accountant.

Ford William J. (Liquidation), Humberstone and Leicester, hosiery manufacturer (separate estate). Trustee, R. S. Mantle, Leicester, accountant.

Whitehead Edmund, (Liquidation), Manchester, Tonge, and Middleton, silk manufacturer. Trustee, W. Butcher, 69, Princess Street, Manchester, accountant.

Shoesmith George (Liquidation), Halifax, wool dealer. Trustee, F. Foster, Halifax, accountant.

Barlow James W. (Liquidation), Radcliffe, bleacher. Trustees, F. W. Briscoe, Bolton, and J. Eckerley, Manchester, accountants.
Horsfall John and Eli Horsfall, trading as Horsfall Bros. (Liquidation), Warley, Halifax, worsted spinners. Trustees, J. I. Learoyd, Halifax, accountant, and W. Garnett, Warley, Halifax, worsted spinner.

Dividends.

Bates Henry S., Ovenden, Halifax, and Joshua Garsed (Liquidation), Elland, rep manufacturers. 2nd and final dividend, 8d.; J. A. Riley, 9, Cheapside, Halifax.
Drummond George (Bankrupt), Bradford and Thornbury, stuff manufacturer. 4th and final dividend, 1d.; J. S. Colefax, Market Street, Bradford.
Pilkington John (Liquidation), Westhoughton, Lancashire, cotton spinner, 1st and final dividend, 1s 3¼d.; J. Naylor, 10, Acresfield, Bolton.
Ratcliffe Eliza, trading as Eliza Ratcliffe and Co. (Liquidation), Norden, Rochdale, and Wolstenholme, waste spinner. 1st and final dividend, 10s.; H. Staley, 25, Drake Street, Rochdale.

Bills of Sale.

Farrar Edwin, Lowtown, Pudsey, Leeds, wool extractor, for £200, to John Brown.
Hartley Arthur, Hoxton Street, Girlington, Bradford, stuff merchant, for £100, to Henry Glaister.
Jones William, Graig Wool Factory, near Merthyr Tydvil, flannel maker, for £10 10s., to S. W. Lorie.
Black Walter, Factory Street, Loughbro', hosiery manufacturer, for £190, to T. Thurman.
Ogden James, 19, Langston Street, Manchester, cotton waste dealer, for £15, to J. Woolfe.

Dissolution of Partnerships.

Walker J. W. and Co., Innerleithen, yarn manufacturers, &c. As regards John Cockburn.
Lowden Joseph and Co., Leeds, cloth finishers and dyers. Debts by Joseph Lowden.
Hind John and Bros., Wyke Mills, Wyke, near Bradford, worsted spinners and manufacturers.
Metcalfe F. and Co., Bradford, yarn merchants.
Kayess, Leves, and Wagland, Tooting, silk and wool printers.
Ackroyd T. and Sons, Birkenshaw, Birstal, worsted spinners and stuff manufacturers. As relates to William Ackroyd.
Holt and Wild, Bottom-o'-th'-Moor, Oldham, cotton waste dealers. Debts by William Henry Holt.
Smith and Stell, Keighley, machine wool combers. Debts by Henry Smith.
Tippin and Rickards, York Street, Manchester, manufacturers and finishers of velvets. Debts by Henry Rickards.
Rawcliffe Bros., Lindley, near Huddersfield, commission weavers.
Bilbrough T. and J., Park Place, Leeds, woollen cloth manufacturers and merchants.
Butterworth, Green and Dean, Padiham, cotton manufacturers.
Chivers and Perkins, Trowbridge, woollen cloth manufacturers. Debts by Benjamin Perkins.
Beecroft and Wagstaff, Nottingham, lace dressers. Debts by Titus Beecroft.
Berry and Liversedge, Huddersfield dyers.
Barlow Joseph and Sons, Radcliffe, dyers and bleachers.
Clarke and Earnshaw, Ovenden, Halifax, manufacturers.
Fulton and Slater, Spring Garden Shed, Burnley, cotton manufacturers. Debts by W. and F. Slater.
Greenwood Bros., Rockfield Mill, Blackburn, cotton manufacturers. As regards William Greenwood.
Greenwood W. and R., Infirmary Mill, Blackburn, cotton manufacturers. As regards William Greenwood.
Sinclair Robert and Co., Mitchell Street, Glasgow, and elsewhere, woollen manufacturers, &c. Debts by Robert Sinclair, 80, Wood Street, London.
Jarvis Bros., Arbroath, mill spinners. Debts by David and T. C. Jarvis, who continue the business.

PATENTS.

Applications for Letters Patent.

465 John Byfield, London, Ontario, Canada, "Improvements in knitting machines."
487 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in beating apparatus to be used in machines for washing textile materials."—A communication.
492 Richard Scott Collinge and Edward Collinge, Oldham, "Improvements in looms for weaving."—Partly their own invention and partly a communication.
549 Peter Thomas, Elberfeld, Prussia and German Empire, "Improvements in bleaching fibre, fibrous matter, yarn, or woven fabrics without the employment of chlorine or chlore."
557 Frederick Albert Gatty, Accrington, dyer and calico printer, "Improvements in dyeing cotton yarns, or yarns of other vegetable fibre in the cop or on bobbins."
572 James Shaw, Huddersfield, "Improvements in apparatus for drying wool, cotton, and other fibre."
581 Carl Daniel Ekman, of Sweden, but now of 57½, Old Broad Street, London, "An improved method of treating fibrous plants in order to obtain fibre for paper making, and for textile and other purposes."
594 Henry Leach Wilson and John Clegg, Clayton-le-Moors, Accrington, washing and wringing machine makers, "Improvements in machines for washing, wringing, and mangling fabrics."
601 Charles Herbert Openshaw, manufacturer, and Charles Henry Rothwell, mill manager, Bury, "Improvements in the manufacture of ribbed fabrics."
627 Joseph Anthony Dixon, 151, St. Vincent Street, Glasgow, solicitor, "Improvements in the production of colouring matters suitable for dyeing and printing."—A communication.
653 James Young, of Kelly, Renfrew, "Improvements in the production of compounds capable of being employed for bleaching and other purposes."
699 James Hollingworth, managing director of the firm of Messrs. Hutchinson, Hollingworth, and Co., Dobcross, woollen loom makers, "Improvements in looms for weaving."
733 Charles Higgin Maxted, Galgate, Lancaster, "Improvements in spinning and doubling machinery."
734 William Henry Hacking, Bury, machine maker, and Edward Grube, of the same place, draughtsman, "Improvements in looms for weaving."
735 Robert Hall, Bury, engineer, and Joseph Walmsley, of the same place, foreman, "Improvements in sectional warping and beaming machines."
745 Henry Harris Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "An improved device for regulating the speed of warp beams in looms."—A communication.
757 Gerard Wenzeslaus von Nawrocki, proprietor of the firm of J. Brandt and G. W. v. Nawrocki, patent solicitor and civil engineer, of 124, Leipzigerstrasse, Berlin, Germany, "Improvements in the process of dyeing cotton yarns and threads."—A communication.
782 William Thomas Stubbs, Manchester, machine maker, and John Corrigan, of the same place, manager, "Improvements in machinery or apparatus for winding two or more yarns or threads of cotton and other fibrous materials on to one bobbin or spool."
785 John Ballingall Hutcheson and James Johnston Dobbie, M.A., D.Sc., Glasgow, chemists, "Improvements in treating textile fabrics and materials in order to bleach or remove color, or to apply or brighten color generally or topically, and in apparatus therefor."
793 Arthur Craven, spinner, Bradford, and George James Warburton, engineer, Heckmondwike, "Improvements in condensers and air-pumps of steam engines."
807 Joe Booth Whiteley, Charles Henry Whiteley, and William Whiteley, of the firm of William Whiteley and Sons, Lockwood, Huddersfield, machine makers, "An improved method and means employed for drying wool and other fibre."
811 James Lumb, Elland, York, brassfounder and finisher, "Improvements in lubricators."
812 William Henry Beck, 139, Cannon Street, London, consulting engineer and patent agent, "Improvements in the manufacture of solid lye composition for washing and bleaching linen, and for other purposes."—A communication.
841 John William Watts, Countesthorpe, Leicester, hosiery manufacturer's manager, "Improvements in circular knitting machines."
863 John Henry Johnson, 47, Lincoln's Inn Fields, Middlesex, gentleman. "Improvements in machinery or apparatus for drawing in warp threads or threading them through heddles."
867 Henry Blackford Payne, Nottingham, "Improvements in the carriages of bobbin-net or twist-lace machinery."
868 Maurice Levy, Knighton, and Frederick Lowe, Aylestone Park, Leicester, "Improvements in tell-tale apparatus for recording the time at which persons enter and leave a factory, building, or other place."
884 John Hardaker, Grace Street, Leeds, "Improvements in grippers for stretching, retaining, or suspending woven or other fabrics or materials."
886 Frederick Ripley, worsted spinner and manufacturer, and Thomas Hargreaves Brigg, machine maker, Bradford, "Improvements in machinery for spinning fibres."
876 George Perkins, George Wimpenny, and Joseph Hampson Evans, Manchester, "Improvements in spinning machinery."
899 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in cotton opening and lapping machines, and in the manufacture of laps thereby."—A communication.
902 Herbert John Haddan, Kensington, Middlesex, "Improvements in the manufacture of asbestos fabrics."—A communication.
908 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in and relating to machinery or apparatus for washing wool."—A communication.
919 Thomas Henry Harrison, Derby, "Improvements in the manufacture of elastic fabrics."
930 Abraham Akeroyd, Bradford, agent, "Improved means of indicating the length of pieces, textile fabrics, cloths, carpets, ribbons, and other piece goods when rolled, folded, or otherwise."
932 Thomas Crabtree, Leeds, "Improvements in the means or apparatus employed for tempering hackle, gill, comb, and card pins or teeth, such invention being also applicable for tempering springs and other articles formed of steel."
936 James Joseph Delmar, Ormside Street, Old Kent Road, Surrey, and William Folliott, Bethnal Green Road, Middlesex, "Improvements in the mode of manufacturing carpets and other similar looped, piled, and double looped and double ground and piled or corded fabrics, also tapestries, damasks, and similar furniture fabrics."

Grants of Provisional Protection for Six Months.

68	78	107	113	115	131	152	154
161	164	167	171	238	241	288	307
323	325	366	373	423	429	430	444
447	451	455	478	487	492	499	513
549	557	571	572	573	581	594	601
604	627	699	733	735	745	4426	5412

Notices to Proceed.

107	115	152	238	288	366	373	384
444	557	581	4263	4266	4290	4348	4353
4389	4399	4406	4465	4495	4545	4734	4752
4774	4847	4911	4980	5190	5626	5645	5713

Patents on which the Stamp Duty of £50 has been Paid.

443 Isaac Holden, of the firm of Isaac Holden and Sons, Bradford, machine wool combers, "Improvements in apparatus employed in combing wool and other fibres."

490 Frank Stewart Sandeman and James McLean, Dundee, "Improvements in batching, softening, or lubricating jute and other fibrous materials."

519 James Bywater, of the firm of Pearson and Spurr, Birstall, near Leeds, machine makers, and Charles Bedford, of the same place, foreman mechanic, "Improvements in looms for weaving, and in apparatus employed therein."

728 Jonathan Scharr, Bradford, soap manufacturer, "A new and improved soap, to be used as a substitute for oil in the preparation of wool or other fibres for spinning and manufacturing purposes."

584 James Hollingworth, managing director of the firm of Hutchinson, Hollingworth and Co., Limited, Dobcross, York, machine makers, "Improvements in looms for weaving."

625 William Terry and John Scott, Dudley Hill, Bradford, commission wool combers, "Improvements in machinery or apparatus for combing wool or other fibrous substances."

731 Thomas Forster Streatham, Surrey, "Improvements in finishing single and double texture india-rubber fabrics."

760 George Keighley, Burnley, Lancaster, machinist, "Improvements in looms for weaving."

1197 James Lang, Preston, William Stancliffe, and John Brierley, of the same place, "Improved swell-pin hinge-joint for looms."

Patents on which the Stamp Duty of £100 has been Paid

479 Honoré François Adophe Cordillot, of Sepouchoff, Moscow, Russia, calico printer, and William Mather, of the firm of Messieurs Mather and Platt, Salford, engineers, "Improvements in apparatus for steaming printed fabrics."

876 Alfred Vincent Newton, 66, Chancery Lane, Middlesex, mechanical draughtsman, "Improvements in machinery for drawing and spinning hemp, flax, and other fibrous substances."—A communication.

Patents Sealed.

3575 Charles Denton Abel, 28, Southampton Buildings, Chancery Lane, Middlesex, "Improvements in bleaching linen and hemp threads and tissues."—A communication.

3462 Duncan Stewart, Glasgow, engineer, "Improvements in machinery for beetling, calendering, or finishing woven fabrics, felt, paper, and yarn."

3480 Joseph Heaton, of the firm of Joseph Heaton and Co., Bradford, wool combers, "Improvements in machinery for combing wool and other fibres."

3503 James Seed, Preston, "Improvements in machinery or apparatus for spinning and doubling cotton and other fibrous substances.—The same is partly his own invention and partly a communication.

3598 Edwin Smith, Houley, Huddersfield, manufacturer, "Improvements in looms for weaving."

3723 Frederick Caldwell, Loughborough, Leicester, "Improvements in machinery and apparatus to be employed in the manufacture of knitted fabrics."

3789 Charles Alfred Barlow, of the firm of Henry Bernoulli Barlow, Manchester, patent agent, "An improved machine for stentering, stretching, and drying fabrics."—A communication.

5313 Benjamin Alfred Dobson, of the firm of Messieurs Dobson and Barlow, Bolton, machine maker, "Improvements in mules for spinning."

5330 Benjamin Alfred Dobson, of the firm of Messieurs Dobson and Barlow, Bolton, machine maker, and James Macqueen, of the same place, machinist, "Improvements in combing machines."

5331 Benjamin Alfred Dobson, of the firm of Messieurs Dobson and Barlow, Bolton, machine maker, and Thomas Wood, of the same place, machinist, "Improvements in openers and scutchers."

3538 James Porritt, Milnsbridge, Huddersfield, "Improvements in the method and apparatus for registering by means of electricity the number of picks woven per inch in looms for weaving."

3625 Isaiah Wallwork and Abel Wallwork, Ashton-under-Lyne, mechanics, "Improvements in pickers and picker spindles, and in the method of lubricating the same, partly applicable to other spindles and axles, and to bearings."

3728 Edward Hagen, Ealing, Middlesex, "Improvements in the production and application of ozonized oxygen for bleaching and other purposes, and in apparatus therefor."—A communication.

3747 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in ring-spinning machines or frames."—A communication.

3842 Samuel Tweedale, Accrington, foreman mechanic, "Improvements in shuttles for weaving."

3855 William James Leopold Hollis, Gainsford Street, Surrey, engineer, "Improvements in lubricants."

3827 Charles Denton Abel, 28, Southampton Buildings, Chancery Lane, Middlesex, "Improvements in machinery for the manufacture of ruched, kilted, or pleated fabrics."—A communication.

4125 John Frederic Harrison, Bradford, commission wool comber, "Improvements in combing wool and other fibres, and in the machinery therefor."

4732. James Kershaw, Macclesfield, "Improvements in the manufacture of merino, linen, cotton, and other textile fabrics woven in broad looms."

4813 William Gledhill, Mossley, Lancaster, "Improvements in the manufacture of tin rollers for mules for spinning."

3758 John Fox, Milton Street, London, machinist, "New or improved machinery or apparatus for 'cutting out' textile or other fabrics."

3791 Walter Alfred Barlow, 6, St. Paul's Churchyard, London, patent agent and engineer, "Improved means or apparatus for preparing vegetable fibres."—A communication.

4908 John Stewart Smith and Samuel Smith, Glasgow, manufacturers, "Imbrovements in the weaving or manufacture of Kidderminster, Scotch, or ingrain carpets, and other similar two or three ply fabrics."

5342 John Hardaker, Grace Street, Leeds, temple manufacturer, "Improvements in temples for looms and in apparatus or mechanism connected therewith."

2009 John Frederic Harrison, Bradford, commission wool comber, "Improvements in machinery for combing wool and other fibres."

5329 Charles Alfred Barlow, of the firm of Henry Bernoulli Barlow, Manchester, patent agent "Improvements in the manufacture of machine embroidery."—A communication.

Copyright of Designs.

(Registered during February, 1882.)

Class VI., Carpets.

376,426 The Heckmondwike Manufacturing Company, (Limited), of Heckmondwike, Yorkshire.
376,444 Henry Fawcett and Co., of Kidderminster.
376,676-77 Benjamin Woodward and Co., Kidderminster.

Class XI., Furnitures.

376,434 S. and F. Sternberg, of 39, Dickinson Street, Manchester.
376,550-65 William Woollams and Co., 110, High Street, Marylebone.
376,532 Thomas Hoyle and Sons (Limited), of Manchester.
376,637-40 S. and F. Sternberg, 39, Dickinson Street, Manchester.
376,655 Daniel Lee and Co., Fountain Street, Manchester.
376,656 Salis Schwabe and Co., 41, George Street, Manchester.
376,681 A. Plowright and Co., 78, Great Bridgewater Street, Manchester.
376,682 The Strines Printing Company, 19, George Street, Manchester.
376,753 Daniel Lee and Co., Fountain Street, Manchester.
376,768 Thomas Hoyle and Sons (Limited), Manchester.
376,781 Salis Schwabe and Co., 41, George Street, Manchester.
376,799 S. and F. Sternberg, 39, Dickinson Street, Manchester.
376,919 Thomas Hoyle and Sons (Limited), Manchester.
376,982 Reiss Brothers, 11, Quay Street, Manchester.
377,124-25 Thomas Hoyle and Sons (Limited), Manchester.
377,262 Thomas G. Hill and Co., 86, Major Street, Manchester.
377 357-60 Thomas Hoyle and Sons (Limited), Manchester.
377,290-94 Daniel Lee and Co., Fountain Street, Manchester.
377,386 Leigh, Appleby and Co., 57, George Street, Manchester.
377,441 Stead, McAlpin and Co., Cummersdale, Carlisle.

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A Design for a Quilt.
A Design for a Tapestry Table Cover.
Messrs. Oldham and Richards' Machine Tools.

Notices.

The Half-Yearly Subscription—payable in advance—including home postage, is 3s. 6d. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 3, Gerrard Street.

The Publishers will be happy to receive intimations of New Inventions, Patents, &c.

The Publishers are open to receive from Designers, Original Designs of Carpets, Damasks, Tapestries, Linen, Cretonnes, &c., and such as are accepted will be published with the Designers name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

Literary communications must, in all cases, be accompanied by the names and addresses of the writers, not necessarily for publication, but as evidence of authenticity.

Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics* for publication, will be considered as offered *gratuitously* unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers in making enquiries of, or opening accounts with Advertisers in this paper, will kindly mention the *Journal of Fabrics* as the source from whence they obtained their information.

To our Readers.

Numerous inquiries having been made for back numbers of the Journal, we beg to inform our readers that all the numbers from the commencement to February are out of print. We have however reprinted our designs and have a stock of 18,000 copies on hand, which we shall be happy to supply in the order in which they were originally published, at 6d. per set, each set representing one month's issue.

Technical Education.

ON a previous occasion we endeavoured to place before our readers, the present position of drawing instruction as given in our elementary schools, art night classes, and art schools. Our readers will remember that the deductions we drew from a review of the question, were, (1) that the machinery at hand available for sound elementary instruction was not sufficiently used; (2) that there was no recognised connection between the instruction given in the subject in ordinary elementary schools, and that given in art night classes, and again between these latter and schools of art; (3) that the time of art masters was taken up in giving instruction in subjects properly belonging to the lower schools, so that the time that should be spent in giving instruction in advanced art, is spent in work of the most elementary character; (4) that because of the centralisation of art instruction in large towns, outlying districts were unable to avail themselves of its benefits; (5) that a very small proportion of the people are found taking advantage of any instruction.

Since the last article was in print we have had the opportunity of going through two of our largest art schools in the district, and the feeling uppermost in our mind on leaving, was one of sympathy for the teachers. To see them struggling to impart instruction in all the subjects of the Second Grade, and in some of the Third Grade, was anything but conducive to that quiet collectedness that we always associate with the beautiful in art. The teaching staff is, as a rule, entirely inadequate, and the internal organization very imperfect; the latter arising not from any want of ability on the teacher's part, but from his desire as far as possible to humour the whims and fancies of the students, some of whom seem to go to the School of Art to do what they like, and when they like. Times and places should, we think, be arranged for the different subjects, and no deviation allowed.

While a knowledge of drawing must lie at the very root of all technical education, there is a still further development, not less important, viz.: the scientific. The study of the various natural and experimental sciences has long been encouraged by the Science and Art Department at South Kensington; and to those of our readers who are not conversant with the work of this Department, we will briefly state what inducements are held out to students desirous of distinguishing themselves in any branch of science, natural or experimental.

1. The Department underakes to pay to the managers of any elementary school the sum of £5 providing they give a like sum towards the maintenance of any scholar who may shew special aptitude. The pupil is selected by open competition and the scholarship is termed the "Elementary School Scholarship" one being given for each 100 on the register of the school.

2. Another very valuable means of assistance is the establishment of the "Science and Art Scholarship" which is of a more advanced character than the Elementary School Scholarship. While the same contribution, viz: £5 is required from the locality per year, £10 is given by the Department; and whereas the age in the first case may be between 12 and 16, in the latter it may range from 12 to 17.

There are also two forms of "Exhibitions," viz.: "Local Exhibitions" and "Royal Exhibitions." "Local Exhibitions" enable students to complete their education at some school or college where scientific instruction is given of an advanced character. Grants of £25 per annum for one, two, or three years are made when the locality raises a like sum. The "Exhibition" must be awarded in competition. "Royal Exhibitions" of the value of £50 per annum, tenable for three years, to the Royal School of Music, London, or the Royal College of Science, Dublin, are given in competition at the May examinations. Six are awarded each year—three to each institution. Besides these aids to individual students, the Department gives, under certain conditions, a building grant of 2s. 6d. per sq ft. of internal space, up to a maximum of £500 to any one school. Grants towards the purchase of school fittings, diagrams, apparatus, &c., to the extent of 50 per cent. of their entire cost are also given. Lastly, where there may be a class but no teacher available, the Department gives a grant in aid of the travelling expenses of one from a distance. These, then, are some few of the inducements held out by the Department to the study of national and experimental science. Examinations are held in twenty-four sciences during the months of April and May, and prizes and medals awarded to successful candidates.

In our next issue we will see how far these advantages have been utilized by the district around, especially noting the distribution of scientific teaching in the urban and suburban districts.

The Barrow Flax and Jute Company.

The works of the Barrow Flax and Jute Company, Limited, at Barrow in-Furness, and the business carried on by them have been purchased by Mr. Thomas Briggs, Spinner and Manufacturer, of 21, Major Street, Manchester Mr Briggs has works in London, Salford and Leeds, and also branches in Glasgow, Dublin, Hull and Kidderminster. The works at Barrow which are in full operation, employ about 2,500 hands, and Mr. Fleming who has been Manager and Secretary to the Company since its formation in 1870, will continue to act in that capacity. In taking over these works, we understand Mr. Briggs is making considerable additions and improvements to the machinery.

Botanical Science in its Relation to Ornamental Art.*

THE Science and Art Department very wisely requires some little knowledge of botany from all the art teachers they train, the questions being framed to bring out not only the knowledge of structure, but to test the candidate's power of applying his knowledge in the direction of art. As I have for some years had the honour of being the examiner, I can readily give some two or three examples of the sort of questions set. "Give five examples of bi-symmetrical flowers;" "Give any details you can of the dandelion—order, genus, specific name, structure, where and when found, its economic or artistic value, and any other points that occur to you respecting it." "Sketch a calyx, a corolla, a leaf, a root, a fruit, and in each case state from what plant you derive your example." "Explain any terms with which you may be familiar, as applied to leaves, descriptive, for example, of their forms, textures, positions on the plant, veining, &c. Illustrate by sketches, and state what plants you use as illustrations." "Draw a square so that one of its diagonals (about 6 inches long) shall be upright. Fill this with a design based on any plant you like, and below it state all you know of the plant—name, structure, previous use in art, &c." I take it that none of my audience will feel that a designer could be anything but the better for the power of answering such questions as these, and that the student who answered the question, "Give botanical details, habitat, season of flowering, &c., of the following common plants:—pimpernel, sow-thistle, woody nightshade, and avens," by saying, "Being a London student, I have not the opportunity of becoming acquainted with these common plants," placed himself at a disadvantage with his fellows I do not say was *placed* at a disadvantage, but placed *himself*, for I doubt not that half-an-hour's walk westward from South Kensington would have placed him in possession of examples of all four plants. Many persons are afraid of science, yet science, after all, only means knowledge, and no one surely need be afraid of that; while the word botany, I need scarcely remind my hearers, is derived from the Greek word for plant. If, then, anyone of my audience, who is alarmed at the notion of being set down to study the science of botany, prefers to consider that I am trying to induce him to learn something about the common plants around him, my object will be equally well attained. There is no doubt that botanical studies can be made to look uncommonly dry to the uninitiated, and that some of the terms are of portentous length, but I contend that all the terms that we deem it essential to the designer to know, can readily be mastered. I remember to haveseen an excellent little work in which all the facts of plant structure were explained in ordinary language, but this necessitated a great deal of roundabout diction that might have been prevented, had a few technical terms been mastered, and as these terms are found in every other book the student desires to consult, it would seem the wiser policy to brace one's nerves to the requisite tension, and face the difficulty. The most accomplished and tasteful designer, if he super add some little knowledge of plant structure to his other gifts, will be enabled to add the great charm of truth to the forms of beauty he creates. Let us now see how far this knowledge may be expected to help us, though indeed I can scarcely hope in the short time at my disposal to do more than indicate some few points to illustrate its claim to our attention. In the first place, our work will be consistent, and we shall employ together plants that have some natural affinity either of time or place: the ignorant draughtsman not unfrequently places together plants that flower in different seasons, or that are found in quite diverse localities. Anyone would, of course, see that there was something chronologically wrong in a group of snowdrops and poppies, or topographically faulty in a combination of water lilies and wheat; yet, extreme as these cases are, I have seen examples that come rather near them. Of course, here again "circumstances alter cases," and one would be justified in blending into one whole the entire floral year, as a wreath on the cover of an almanac for example. In the next place, our forms will be correct instead of false. Conventionalism legitimately sets us free from the necessity of identifying our forms with those of nature, but a natural treatment requires an observance of natural facts. If we desire to use the graceful five-pointed leaves of the ivy we may not add thereto the clustering berries, for these are accompanied by leaves of a wholly different character, nor may we add tendrils to the convolvulus, an error too frequently committed. Further, it will prevent our falling into the error of making our stems grow out from each end, when a little spinal curvature prevents our at once noticing our preversion of natural facts. No natural stem sprouts equally from each end. * * * * * Having thus far dealt with negatives, and pointed out what a study of natural forms will prevent us doing, let us consider one or two things which it will aid us to do. In the first place, the infinity of variety in nature will be reflected in our work, and instead of the constant repetition of some few forms, beautiful as they may be, the whole realm of nature is outstretched before us either to adopt literally, or to adapt as the nature of our work requires. The Egyptians felt the beauty of natural forms, but give us little beyond the lotus, the papyrus, or the palm leaf; the Greeks, earnest students of nature in its highest branch, the human figure, were content to express the overflowing wealth of floral beauty around them by the graceful ocauthus leaf, and more rarely—in the vase decoration, for example—the olive, the ivy, or the vine; the Gothic carvers give a far greater variety, and bring before us the oak, the maple, ivy, buttercup, wild rose, and many other beautiful forms, but even they left much untouched. I may, perhaps, be reminded of the Greek honeysuckle pattern, but the antheminon is rather a testimony to the beauty of a mass of radiating and up-springing masses, instinct with a suggestion of vitality and growth, than a definite suggestion of any one plant, and we can only ourselves regard its occasional resemblance to the buds of the honeysuckle as an accidental, rather than an incidental result. * * * .

(To be continued.)

* Part of a Lecture delivered by F. Edward Hulme, F.L.S., F.S.A., before the Society of Art.

The National Art Training School.

The distribution of prizes to the students of the National Art Training School took place a few days ago in the Lecture Theatre of the South Kensington Museum. Earl Spencer, in a speech to the students, said he did not propose to give them a lecture on art, but to speak as the head of the department under which this school was placed, and as one of the public who took a deep interest in the improvement and progress of art culture, believing that it went on concurrently with the improvement and progress of the whole country. Whether in politics, education, or art, they all had their critics, and when these critics were just, as they often were, they served a good purpose. The first objection that critics made to these schools was against their being State-aided. He (Earl Spencer) attached great weight to self-help and self-support, but it was the experience of this country and of other nations that the highest culture could not be obtained without some sort of endownment. Of old universities and endowed schools in these countries had recognised this fact in regard to education, but it had been reserved for this generation to spread the same system throughout the country in regard to science and art. Already they might see one result in the fact that in many of their industries taste and artistic design had obtained a money value. Nottingham used to send to France for designs, but this was a thing of the past. In 1851 there were only seventeen schools of design in this country; in 1880 there were 151, and in 1881 there were 182. This school, besides affording an art education to many students, was intended to form an institution for the training of teachers, who would, after leaving it, proceed to the various schools in the country. It was sometimes said that in old times we had great artistes without schools such as these — that our Turners, Gains-

boroughs, and Sir Joshuas arose without any schools. No doubt such men would have overcome all obstacles. This institution might not create great men such as these, but it could increase the number of those capable of doing admirable work for the many. In the past works of art were to be found almost solely in palaces and churches; but now admirable specimens of art might be seen in public museums and in private houses. The influence of art was now felt in the architecture and in the furniture even of the humblest homes. It was to spread the advantages, to gain greater opportunities for elevating the minds and intellects of the people by the influence of art, that the Government and the public at large were so interested in this school.

Imitation Tapestry.

SOME improvements in the manufacture of artistic hangings or fabrics have lately been perfected by a French inventor, which it is claimed, will rival in appearance some of the masterpieces of antiquity. In the fabrics obtained can be reproduced antique frescoes and pictures, and they admit also of the production of original artistic designs under various forms. For weaving what the inventor terms Gobelin tapestry, the same kind of loom is employed as is now used for the manufacture of Ausbusson, Beauvais, and Gobelin tapestries, or in weaving reps, poplins, cotton, or silk velvets, figured silk, &c., but any other suitable kind of loom may be used for the purpose. When any given patterns are to be produced in different materials a Jacquard may be used. The following materials can be employed in making the fabrics: — silks such as spun, raw, orgauzuie or tussore; wools, English merino, mohairs, &c., thoroughly scoured and bleached without the use of sulphur; cotton, flax, jute, and many other textile materials. The colours employed are those which are found in practice to be most permanent and most capable of resisting the action of the air and sun, and of remaining unchanged by washing and cleaning. As the colouring requires to be performed at one operation, each of the colours composing the artist's palette contains its own particular mordaunt, of which the principal are oxalic, tartaric, hydrochloric, acetic, sulphuric, and nitric acids; sulphates of copper, iron, alumina, and soda, vinous and wood alcohols, and salts of tin, with the addition of a thickening of gum, gelatine, or glycerine. The fabrics are stretched upon frames of proper construction, which may vary according to the size, kind of fabric, or subject to be produced. Various kinds of frames may be used for stretching the fabrics, perhaps the most simple being such as are used ordinarily in picture painting, with the addition of laths applied upon the side faces of the frame for the purpose of raising the fabric from the cross bars during the operation of painting. In cases where the design or work is to be re-produced on a large scale on the tapestry any of the various methods may be employed for enlarging the design to the required size. After the design has been drawn in, it is pricked with fine needle points either by hand or by machines, the pricking being performed through three sheets of thin paper. The design may be traced upon the fabric by means of pounce or a mixture of white lead in powder. For white or light-coloured fabrics bitumen may be employed; and for drawing on delicate material, especially silk, finely-crushed charcoal, such as that used for making crayons is preferable, which may be spread with the aid of a pounce-bag, or a small roll of cloth or felt, whose end forms the rubbing surface. The brushes used should be of very short sable hair, possessing the necessary stiffness for effectively applying the colour to the fabric. Besides these brushes, it is necessary to use scrapers of metal, ivory, or wood, for a purpose described hereafter. After many experiments the following has been adopted as the best method of painting After the fabric has been stretched, and the design applied, the principal outlines should be gone over with a fine pointed conte crayon, after which any particles left by the pouncing are brushed off. The painting is then proceeded with as for water colours, the light parts being reserved till the last, and care being taken to allow the first tint to dry before applying another in close proximity when it is desired to have a strong contrast of colours; on the other hand, the tints are applied one over the other while moist when it is desired to blend the colours. For large flat tints the colour is to be thinned down to one half its strength with gum, and two coats applied. Finally, the light parts are varnished, and the high lights put in with a scraper, either at the moment the gum colour begins to set, or after it has become perfectly dry for the highly gummed parts. To obtain effects of great intensity the tints are applied several times over, as well as on the back of the fabric. To obtain bold transparent lights, a very light tint is applied on both sides of the fabric. Stencil plates or wood blocks may be used for certain parts requiring to be re-produced a number of times, and afterwards finished in the manner before described. The pieces, after going through the operation of steaming and fixing, which form very important parts of the invention, and would need considerable space to describe fully and accurately, when thoroughly dry, are examined by the artist, and when necessary, are again stretched on the frames, to admit of being touched up. After each retouching, the different operations are repeated, until a satisfactory result is achieved. In some old manufactures, a mixture of woollen, silk, and metallic threads has been employed, these being introduced either in the act of weaving or afterwards. This latter method is generally adopted in the present case (the needle or a sewing or embroidering machine being employed) but not exclusively, as under the head "weaving" mention has been made of the employment of a Jacquard and other apparatus for producing certain prearranged effects in weaving. These effects are directly produced of the proper colour indicated by the application of tints composed of moist colours obtained by grinding the colour with gum, alcohol, and ox-gall, or gouache colour may be used for the purpose. After the desired effects have been worked in with the needle, the colours are carefully removed from off the surface of the fabric by brushing. Another method consists in simply introducing white threads of wool or silk at the desired points, the piece being then returned to the artist for the purpose of being coloured at these parts, if necessary, by means of the colours previously described. In the case of velvet, another method is employed also, forming part of this invention, which consists in the production of high lights or bright or incandescent effects, by means of heated irons applied at any point, according to the taste of the artist.

A Novel Design.

At the forthcoming Exhibition to be held in Bradford, probably one of the most attractive things in the machinery department will be a loom fitted up by students of the Technical School, in which will be woven a design commemorative of the opening. It is the production of Mr. T. R. Ashenhurst, head instructor. The design is about 14ft by 9ft., and requires nearly 17,000 cards. The finished production will be 14 to 16 long and about 10 inches wide, and will probably be woven in black and white, with silk and worsted yarns. In the centre will be a view of the school. In the upper corners there will be portraits of the Prince and Princess of Wales, and in the lower portraits of Mr. Henry Mitchell, President of the Technical School, and Lieut.-Colonel Britton, Master of the Clothworkers' Company, who laid the memorial-stone of the building. The portraits are to be surrounded by scroll work, and between them will be eight miniature views representing the old and new processes of carding, combing, spinning and weaving. The design has been divided into two portions, and entrusted to about 24 students of the Technical School to work out.

The Lake of Constance is so low that steamers cannot reach the port of Romanshorn, and passengers from Lindau have to be landed in small boats. The Rhone was never so low in the memory of man. All the mills on its banks from Geneva to Bellegrade are at a standstill, a circumstance absolutely without precedent.

The Fair Trade Agitation.

IT seems that the question of Fair Trade, which is at present agitating the minds of our textile manufacturers, is no new one, but a repetition of what took place in England nearly two centuries ago. Mr. Birdwood, who has been for some years collecting tracts relating to the East India Company, has had his attention drawn to a MS. copy of "Prince Butler's Tale," which was sold in London in 1699. In writing to *The Athenæum* he says "During all the years that I have been collecting the tracts, I have never come across this one; and as it bears a close resemblance to the Bombay Trade Ballads against European manufacturers, to which I drew public attention last year, and chimes in opportunely with the Countess of Bective's social propaganda in favour of English woollen goods, and that of the Hon. Mrs. Mitford in support of English silk goods, I hope you will be as interested as I am in republishing it." After the argument, representing the state of the English wool trade in the seventeenth century, and a prologue, follows

THE TALE.

When first the Indian Trade began;
And Ships beyond the Tropicks ran,
In quest of various Drugs and Spices,
And sundry other strange Devices;
Saltpetre, Drugs, Spice and like trading,
Composed the bulk of all their Lading.
Bengals, and Silks, of Indians' making,
Our Merchants then refus'd to take in;
Knowing it wou'd their Country ruin,
And might prove to their own undoing.
Nor did they carry Gold or Bullion,
To fetch home what supplants our Woollen:
Nor were this Nation fond to wear
Such Indian Toys, which cost so dear.
Then were we clad in Woollen Stuffs,
With Cambrick Bands, and Lawn Ruffs,
Or, else, in Silk. which was imported,
For Woollen Goods, which we exported:
Which Silk our English Weavers bought,
And into various Figures wrought.
Then scarce a Child was to be seen,
Without *say* Frock that was of Green:
Our Hanging Beds,– our Coats and Gowns,
Made of our Wool in clothing Towns.
This Nation then was rich and wealthy.
And in a state which we call'd healthy.
But, since the Men of Gath arose;
And, for their Chief, *Goliah* chose:
And since that mighty Giant's Reign,
Whose chiefest Aim was private Gain:
This Trade was drove on by such Measures,
As soon exhausted much our Treasures:
For, then, our chiefest Artists went
With Patterns, and with Money sent,
To make and purchase Indian Ware;
For which this Nation pays full dear.
Then, by great Gifts, of finest Touches,
To Lords and Ladies, Dukes and Dutchess,
So far prevail'd, as set the fashion;
Which, Plague-likes oon spread o'er the Nation.
Our Ladies were all set a gadding;
After these Toys they ran a madding:
And nothing then wou'd please their fancies,
Nor Dolls, nor Joans, nor wanton Nancies,
Unless it was of Indians' making;
And, if 'twas so, ' twas wondrous taking.
This antick humour so prevail'd,
Though many 'gainst it greatly rail'd,
'Mongst all degrees of Female-Kind,
That nothing else could please their mind.
Tell 'em the following of such fashion
Would beggar and undo the Nation;
And ruin all our labouring Poor,
That must, or starve, or beg at Door;
They 'd not at all regard your Story,
But in their painted Garments glory:
And, such as were not Indian proof,
They scorn'd, despis'd, as paltry Stuff:
And, like gay Peacocks, proudly strut it;
When, in our Streets, along they foot it.
This humour strangely thus prevailing,
Set all the poorer sort a railing;
Or else, with grief, their Case bewailing.
The Richer seeing what was doing,
And how the Nation ran to ruin,
To King in Council did complain,
In time of Charles the Second's Reign.
On which were several Lords appointed,
By him who was the Lord's Anointed,
To hear the Case, and sad Complainings,
Of those that *then* were for restrainings:
Who plainly did their Lordships tell
What mischiefs to our Trade befell:
How both our Men and Bullion went
To work in India;—and be spent
In needless Toys, and gaudy Dresses,
For Ladies, Madams, Trulls, and Misses.
The Case thus heard, they were inclin'd
Some proper remedy to find;
And something was in order doing,
To put a stop to further ruin:
But, by the craft of Great Goliah;
Who all the Hoast stood in defy-a;
There is this Story passing current
That say 'twas he that stopp'd this Torrent;
By pouring Gold, in plenteous Showers,
In Ladies' Laps, who bore great powers:
Which strangely alter'd all their Measures;
Such charms there are in hidden Treasures.
Thus barricading all Complaints,
Drove, Jehu-like, without restraints:
Fill'd Town and Country soon so full,
As ruin'd much our Trade in Wool:
And such great Stocks of Wool and Cloths
Were hoarded up, and eat by Moths,
Made Clothiers all and Growers grumble,
When Clothes and Fleeces o'er they tumbled:
And, further mischiefs to prevent,
Complaints were made in Parliament:
And, 'cause the Wool so near affected,
This Salvo for 't was then projected;
That, since the Living would not bear it,
They should, when *dead* be forc'd to wear it.
This help'd in part;—but the Grand Ill
Remains upon the Kingdom still:
Yet, this our Ladies so offended,
As all our Female Sex contended;
And fain would had this Act rejected;
But, then, their counsels were neglected;
And time has reconcil'd it so,
To this Wool-Act they's now no Foe;
So that, from Ladies great to Scullion,
All buried lay in our own Woollen.
And, happy thrice would England be,
If, while they're living we could see
Our Noble Ladies but beginning
To wear our Wool of finest spinning:
Or, in such Silks our Workmen make;
For which our Merchants Cloth do take:
Which soon wou'd bring them in such fashion,
As they'd be worn throughout this Nation,
By all Degrees, and Sex, and Ages,
From highest Peers to lowest Pages;
Nor would the meanest Trull or Besses
Delight to wear these Indian Dresses:
Which certainly wou'd profit bring
To them, their Tenants, and our King;
And Heaven's blessings in the bargain,
Because they 'll keep our poor from starving:
For they wou'd soon be then employ'd;
Our Money too at home wou'd 'bide:
And happy, then, both Great and Small;
With mirth in Parlour and in Hall:
When thus, with Plenty, Beards wag all.

The Use of Anilines in Dyeing.

Most of the goods which at present come into the market are dyed with anilines or tar colours. Although indigo, madder, weld, etc., have not been able to be replaced in regard to fastness, the possibility is that science will also find substitutes for these articles, which has not so far been done. Tar colours have not found their way so much into our clothes-dyeing establishments as in others, and the old colours have here, especially in dyeing woollen fabrics, the principal part. Indigo, madder, archil and the dyewoods could not be substituted so much as in the large works. If we inquire about the cause of this, we can first mention the greater difficulties in clothes dyeing. We have to work in this case with articles already used, generally mixed with fat, dust, resinous matter, etc., and they generally show, even after cleaning, an even surface, which is different according to the nature of the goods. The pieces which have suffered most by sun and air have experienced a change, and distinguish themselves more or less after redyeing. Thus it may be explained that especially those fabrics which were dyed previously with tar colours have suffered a decomposition of the colouring matter as well as the metallic salts, and a heavy substance remains in the fibre which changes the dyeing capacity. We have not so far succeeded in restoring the so-called faded places entirely; but one dyeing establishment will obtain better results than another. It is necessary to use the greatest care in cleaning and stripping the goods, and if tar colours should find sometimes more use in this branch of dyeing, the reason is certainly found in the more careful preparation of the goods. The dyer has to clean the fibre as much as possible; a treatment in a bran bath is to be recommended. There is generally less trouble with silk goods. The passing through a boiling soap bath as well, which cannot be used with woollen goods, as the favourable qualities of the silk fibre add much to the prospects of good results. It is therefore easily explained why tar colours are used more extensively in silk dyeing than in other fibres. The greatest obstacle for the successful use of these colours consists not only in the fact that their nature is not known well enough, but also in their many various kinds. The dyer must know how to use them in mixtures and to choose the best mordant. In clothes dyeing, dye-baths containing aniline colours, which are often of great value, are thrown away, because they cannot be immediately used again. We do not say that this always can be avoided, but surely very often. Generally, if the mordant is not chosen correctly for the mixture of two different kinds of aniline, f. i., azo colours with aniline or resorcine colours, where the mordant may be good for one, but not for the other colour, the waste of colour seems to be unavoid-

able. These colour mixtures are also often very costly, without producing bright shades. It is therefore necessary that the dyer should know the nature of his colours, and this knowledge will certainly add much to the quicker introduction of the tar colours into all branches of dyeing. If azo and resorcine colours are used in a mixture on wool, it is unnecessary to use alum; if azo colour is used alone, glaubersalt and sulphuric acid must be taken. If we should use sulphuric acid for a mixture of both of the above colours, the resorcine dye would be useless. For this reason, resorcine cannot be used together with acid fuchsine. Anilines, with the exception of acid colours, are seldom used in connection with the above mixed mordants. The same can be said regarding their use on cotton goods. The mordants must be selected to work well with the colour. In silk dyeing on clothes, anilines are already more frequently used; among them are fuchsine, violet, cardinal, cerise, maroon, methyl green, saffranine, etc. The azo colours, pouceau, orange, orceine, scarlet, Biebrich scarlet, fast red, are dyed with sulphuric acid in the soap bath. Resorcine colours are also dyed in a soap bath with acetic acid, f. i., eosine, erythrosine, rose benzole, scarlet, etc. In mixtures of resorcine with azo colours, the dyeing is always done with acetic acid, and generally some more of the azo colour is left in the bath. It is generally practicable to treat the goods first in the cold neutral aniline bath, and then whilst slowly increasing the temperature, the acid is added. Silk may be worked a little quicker; it can also be boiled more than woollen goods.—*Deutsche Faeber Zeitung.*

The Bleaching of Linen, Hemp, and Tissues.

A process which cannot fail to be of great advantage to manufacturers has been patented for the bleaching of linen, hemp, and tissues. By this invention the operation of bleaching by exposing the fabrics to the action of the air on bleaching grounds is entirely obviated, the improved process being applicable to any description or quality of fabric made from linen or hemp, or to the raw material, whether it has been already subjected to a preparatory chemical treatment or not. The process of bleaching is as follows:—

The threads or tissues are first subjected to a series of successive boilings in alkaline liquors, which remove the pectinic substances accompanying the cellulose, and also all foreign substances remaining from previous treatments, after which they are passed simultaneously through a solution of chloride of lime, and a solution of sulphate of alumina, saturated with hydrate of alumina. These substances produce a reaction which liberates oxonised oxygen that possesses a much greater bleaching power than chloride of lime, even with the addition of acid, and which has the further advantage of having a much less detrimental effect upon the fibres than an equivalent quantity of chloride of lime. The strength of the solution of chloride of lime to be employed should vary according as the tissues are composed of finer or coarser threads, or are more or less charged with matter requiring the bleaching action, and consequently according as the bleaching is more or less difficult. Under any circumstances a solution of 100 degrees may be used without any danger. The proportion of sulphate of alumina saturated with hydrate of alumina employed should be in exact proportion to the quantity of chloride of lime used. The products of reaction deposited on the fibres may be removed by simple washing. In order to produce a perfectly white colour, the threads or tissues that have been subjected to the above decolourising process are boiled in a soap solution, to which is added ammonia, after which they are subjected to a second process similar to the first.

The importance of the above process as an improvement in the bleaching of linen and hemp must be appreciated by manufacturers. Up to the present time a white colour, if we may thus express it, has only been obtained by the combined action of the air moisture, and chloride of lime, the latter when used alone only giving a yellowish white, which does not satisfy the requirements of trade. The combined action of decolourising agents require repeated exposures on fields, which subject the bleacher to the uncertainties of the weather, the bleaching operations having often to be suspended. In addition, the threads and fabrics are liable to be damaged in various ways. By the above improved process the tedious and often inconvenient air bleaching process with its many disadvantages is obviated, and the linen or hemp is bleached, like cotton fibre, by a process which effects a considerable economy in labour and time, and results in a perfectly regular and reliable manufacture, obviating all the uncertainties which at present render it difficult for the bleacher to judge of the time his work may be completed.

The Pacific Mills Strike.

We learn that the reason for the effort to reduce wages at the Pacific Mills, Lawrence, Massachusetts, is the depressed condition of the worsted industry, in which the Pacific Company has long been very largely engaged. It has also been an extensive producer of cotton goods, but the true cause of the present trouble is the adverse condition of the worsted department. The change of fashion which has led to the substitution of soft woollens for the stiff worsteds known in this country as Bradford goods has spread to the United States, and the proprietors of the Pacific Mills find themselves in the same unfortunate position as the manufacturers of Bradford, whose troubles the Countess of Bective has been trying to alleviate by directing the fashion back into its old channel. The woollen department of the Pacific Mills, says the *New York Times*, has hitherto been engaged almost exclusively in the production of "Bradford" goods, manufacturing annually about 30,000,000 yards of cloth. The machinery employed in preparing and spinning the yarn for these goods is quite unsuitable to deal with the softer wools. The Pacific Company is therefore engaged in taking out this machinery, and substituting for it fresh plant capable of producing what the new demand requires. Of course this process is a very costly one, and within the past six months the market value of the Company's stock has fallen to the extent of £400,000; the shares which were quoted £560 each being now worth only £360 each. Apart from this special cause, however, which has wrought such havoc in the case of the Pacific Company, a perceptible decline has occurred in the prosperity of the American Textile industries generally, and a great fall is recorded in the value of the shares of several great corporations, notwithstanding that respectable dividends were paid last January—partly out of reserve funds no doubt. Attentive observers attribute this adverse turn of affairs to the over-production induced by excessive protection.

SCIENTIFIC AND ART NOTES.

The Summer Exhibition of the Fine Art and Industrial Exhibition, York, will be opened to the public on May 25, and continue open till the end of September.

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The authorities at South Kensington Museum expect to receive the Jones bequest in about a month, and will arrange in it a compartment reserved for the purpose, according to the terms of the legacy.

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The total estimated cost of the National Gallery for the ensuing financial year is £17,878, of which about £4,000 is distributed in salaries to the officials, and £9,600 is allowed for the purchase of pictures.

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One of the deepest wells ever drilled for oil purposes is the Tack Bros. well, recently finished in Millstone Township, Elk County, Pa. It was drilled to a depth of 2,600 feet, and was dry. The sands were found regularly, and the second sand looked very encouraging, but all hopes were abandoned when the third sand was passed and no oil found.

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Paraffin is extensively consumed in a variety of ways as a water-proofing agent, an application for which its perfectly neutral chemical properties excellently adapt it. It is used for water-proofing textile fabrics of cotton, woollen, and even silk. Sometimes it is used for this purpose in the form of a solution in naphtha, for water-proofing felt hats, umbrellas, and silk goods generally; also for water-proofing paper. In addition to the above we may add that it is used to some extent for sizing or finishing textile fabrics.

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Referring to the Electric Light, as to the cost of incandescent lamps, precise information is somewhat difficult to obtain. The Lane Fox is said to cost 15s, the Maxim 12s. 6d., and the Swan 5s.; but as Mr. Edison declares that he can produce his at a net cost to himself of 2s, it is evident that the minimum price has not yet been attained. Mr. Swan uses carbonized cotton fibre, treated with sulphuric acid. In the Lane Fox lamp the carbon filament is made from esparto grass, while Mr. Edison, after scouring the world for a suitable material has decided that the best results can be obtained from Chinese bamboo. The average duration of a lamp is said to be one thousand hours, so that one in ordinary use should outlast a winter. Of the comparative cost it is as yet too early to speak. Mr Swan is sanguine enough to talk of producing light by incandescence at one-third the price of ordinary gas; but the Exhibition at the Crystal Palace is sufficient to show that, even if electricity were produced at equal cost to that of gas, it is likely to be preferred to the latter wherever light is wanted without heat.

ORIGINAL DESIGNS.

In our last issue we gave an extract from an American contemporary, upon Carpet Borders, which we supplemented with some remarks of our own upon the advisability of altering the style of borders at present adopted by most carpet manufacturers. Our first plate provides an example of a three-quarter wide Brussels carpet design with half yard border totally different from the body, but yet so far in keeping with it as to produce a harmonious effect. The design here given will make a capital four or five-frame carpet. For a five-frame a good colouring will be: the ground Black; with the pattern worked in Pale Chrome; Pale Blue; Brown and Crimson. The design is drawn by R. Lord, Gerrard Street, Halifax.

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Our second plate is a design for a Quilt, which we have no doubt will prove of service to manufacturers of this class of fabrics. This design is from the pencil of Mr. J. C. Bowins, of 68, Mawson Street, Ardwick Green, Manchester.

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Mr. Ezra Hoyle contributes our third plate, which is a suggestive idea for a Tapestry Table Cover. The space at our disposal does not permit of showing as much of this pattern as is perhaps necessary, in order to give an idea of the general effect of this design when fully repeated.

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*** We beg to inform manufacturers and others that adaptations of designs, published in the "Journal of Fabrics," can be made at the Office by experienced Designers, and that Original Designs can also be furnished at moderate charges.

MONTHLY TRADE REPORTS.

Wool.—The London sales have progressed satisfactorily for sellers; the better classes of Australian wools especially have shown a marked advance in prices, the competition for these sorts have been keen The lower classes have sold fairly well, prices keeping about the same as at the opening of the sales. In Liverpool wools of a superior quality have maintained former values, with perhaps a slight tendency to rise, inferior and wasty lots have declined in prices. Of a total of 13,275 bales offered at the sales, only 2,700 passed the hammer. The third series of East India sales will open on the 16th of May. In Bradford and Halifax the demand has been very languid during the whole month, prices on the whole have kept moderately firm; although lower prices have been taken in many instances for stronger sorts. Botany of fine qualities has sold freely, and has advanced in price. In Leeds and Huddersfield the markets have been quieter, but prices have kept firm. The yarn trade has been generally quiet and prices have become weaker, the same may be said of the piece trade. Perhaps a better feeling exists at the latter part of the month than existed at the commencement.

Cotton.—There has been a steady demand for the raw material during the whole month, prices have fluctuated; upwards when the demand became strong, downwards when buyers became reticent. In yarns and cloth, the business done has been of a dragging nature, but without much yielding in prices owing to the general firmness in the raw material. Spinners seem to have the advantage in the present state of the trade. Continental buyers as a rule have been inactive. In the home trade a very slight improvement has taken place.

Woollen.—The trade has been like the preceding month, active; prices having a hardening tendency. The shipping firms have been busy with orders for the Continent, Canada, and Australia. The machinery in the whole of the districts is still running full time.

Linen.—A quiet feeling has pervaded the markets; although a considerable business has passed during the month it is feared it has been done at unprofitable prices. Flax improved slightly in the earlier days of the month, but the demand did not make much progress. Stocks of both the raw material and goods are not heavy, but manufacturers see little inducement to add to them in the present state of the trade.

Carpets.—The trade has continued good, and manufacturers have plenty of orders on hand at fairly remunerative prices. Some little anxiety is caused by the fickle state of the wool trade. Rug manufacturers are very busy.

Lace.—There has been an increased business during the month, especially in the curtain trade. Foreign business has come in pretty freely, and the home trade has partaken fully of the activity. Silk nets have become rather quieter. Prices for all sorts keep very firm.

The Society of Arts' Patent Bill.

The Bill for the Amendment of the Patent Law, prepared by the Council of the Society of Arts, has been brought in by Sir John Lubbock, Mr. W. H. Smith, and Mr. J. C. Lawrence, Q.C.

The following are some of the principal alterations which will be effected by this Bill:—

By one of the interpretation clauses it is provided that an invention is to be deemed new unless it has been published, or publicly used, within a period of thirty years preceding the date of the application for a patent for it. The object of this is to prevent the invalidation of a possibly useful invention by an old, and it may be an incomplete description of something like it. At present, an otherwise good patent might be overthrown on the ground that the invention had been anticipated by a description in an obsolete and unknown book, of which a single copy existed in the British Museum. For the first time in any Act or Bill dealing with Patents, an attempt is made to define what is subject-matter for a patent. Under the present Act, the only definition is that contained in the Statute of James I., known as the Statute of Monopolis, namely, "any manner of new manufacture within this realm."

The Bill provides for the appointment of a Board of Commissioners of Patents, to consist of an engineer, a chemist, and a lawyer. These Commissioners are to carry on the duties of the existing Commissioners, and certain other functions specially provided by the Bill An applicant for a patent would be required to lodge his application, as under the present law, accompanied by a provisional specification, and would receive provisional protection for his invention on such application. The provisional specification would then be referred by the Commissioners to an Examiner, who would report whether the invention was subject-matter for a patent, whether the title was sufficient, and whether the provisional specification was in accordance with the title. If the Examiner reported advisedly, the application might, if the applicant persisted, be proceeded with, but in that case every copy of the patent would be endorsed with a statement of the Examiner's report. The next step on the part of the applicant would be the lodging of a complete or final specification, together with a written request for the sealing of the patent. This final specification would be examined in the same way as the provisional, to see if it agreed therewith, and also whether the nature and object of the invention were stated with sufficient clearness. No examination whatever as to the utility or novelty of the invention is contemplated. Provision is also made for cases in which the applicant prefers to file a complete specification in the first instance, without the preliminary step of filing a provisional. On the grant of the patent the complete specification is to be published. If the application be not proceeded with, the provisional specification would be destroyed. The object of this is to prevent the incomplete description given in an abandoned provisional specification from interfering with any future application for a patent for a similar invention.

The term of the patent is to be 17 years, subject to the payment of duties of £5 on the grant, £20 at the fourth year, £50 at the eighth year. The fee on application is set down at £2 10s. The total cost of a patent, in the first instance, would thus be £7 10s.; the fees for the full term would amount to £77 10s. Large powers of amendment are given under the bill. Applications for prolongation would be made to the Board of Commissioners, not as now, to the Privy Council. Prolongation could be granted for any period not exceeding 11 years. No conditions could be made in respect of an order for prolongation, and special instructions are given to the Commissioners as to the points which they would have to consider in granting or refusing it.

As in some previous bills, but not under the existing law, the patent is to have the same effect against the Queen as against a subject. Certain limitations with reference to naval and military service are provided.

In certain very special cases the Commissioners are permitted by the Bill to order a patentee to grant licences.

The duties of Commissioners are stated at greater length than in the Act of 1852, or than in any previous bills. It is specially laid down that they are to prepare indexes, abridgements and such other works as they think proper; to keep open a museum and library free of charge, and to print and keep on sale copies of all specifications, &c.

A defendant in a patent action is not allowed to set up as a defence that a part of the patent other than that stated to be infringed is invalid, and thereby the whole of the patent vitiated. The Commissioners are to act as assessors in patent actions when required by the Court, or patent actions may be referred by order of the Court, to the Commissioners instead of to an official referee; and further, it is to be the duty of the Commissioners to act as arbitrators whenever the parties to the action agree.

J. C. BOWINS.

DESIGNED BY EZRA HOYLE.

SILK

DURING the earliest times the very existence of silk was unknown, and when first discovered the knowledge of it came from the far east, and spread very slowly to the west. It is most probable that the Egyptians, during the height of their glory and civilization, knew nothing of silk, as no vestige of it has been found either in the tombs or amid the ruins of that ancient kingdom. It is true that according to our authorised English version of the Bible, silk is mentioned in the books of Ezekiel and Proverbs, but the best Hebraists have decided that the translation is incorrect, and that silk was not known to the ancient Israelites. From written records still extant, it appears that the silkworm and the treatment of its productions were known to the Chinese as early as 2700 B.C. The beauty and utility of the fibre obtained from this insect was discovered by the Empress of this dominion — the consort of Hoang-tee — who with her own hands unwound the cocoon and wove it into a fabric of wondrous brilliancy. During many ages the Chinese had a monopoly of this manufacture, and so jealously did they guard the worms that when the woven silk, ages after, was imported into Rome, it was shrouded in mystery. Some thought the raw material grew as fleeces on trees, others that it was obtained from the bark of trees, or from flowers. Silk is the production of the common silkworm, of the larvae of several moths, both of Europe and Asia, and of the spider. The only worms of importance, in a commercial point of view, besides the mulberry feeding worms, are the Tussah and Arindy—worms of India. Aristotle, to whom we are indebted for many discoveries made in natural history during the conquests of Alexander the Great, gives the earliest information we have concerning the silkworm. He says, "It is a certain great worm, which has, as it were, horns, and differs from others; at its first metamorphosis produces a caterpillar, afterwards a bombylius, and lastly a necydalus. It passes through all these forms in six months. From this animal some women unroll and separate the cocoons, and afterwards weave them. (Aristotle does not say that the silkworm was *reared* in Cos, and raw silk *produced* there) It is said that it was first woven in the Island of Cos, by Pamphile, the daughter of Plates." He adds that "silk was brought from China, through India, across the Arabian Ocean, up the Red Sea, and across the Isthmus of Suez (or perhaps overland by Persia) to the little island of Cos, off the coast of Asia Minor." This was the well-known coan silk, which was so light and transparent, that the form and the colour of the body could be seen through it, and it was spoken against, not only by Latin poets, but by heathen moralists. Pliny, writing 400 years after Aristotle, mentions the Bombyx (silkworm), and describes it as a native of Assyria, which produces bombytria (silk), and adds that the people of Cos learnt the manufacture of it from the Assyrians. He seems to have confused the *manufacture* of silk from *cocoons* with the *unravelling* of Chinese silks, and *weaving* their threads again into gauze. It is most likely that the raw material was imported from China, and woven in Assyria and Cos. Dionysius, Perigetes, the geographer, who was sent by Augustus to draw up an account of the eastern regions as late as 275 to 323 A.D., and Virgil seem to have had no correct information as to the original source and manufacture of Chinese silks; the latter says—"the Ceres *(Chinese)* comb the variously coloured flowers of the land to make their precious garments, rivalling in colour the flowers of the meadow and in fineness the spider's web" Raw silk, Indian, if not Chinese, may have been known and woven in Egypt, Western Asia, and Cos, for many generations before silken goods were brought to the west, in which case Pliny's error consisted in concluding from Aristotle's statement about Pamphile that the silkworm was bred in Cos. Pausanuis who wrote 100 years after Pliny's time describes the silkworm and says "that the Greek name was seer, that the insect lived for five years and fed on haulm," Ptolemy the geographer was the first who used serice for China (northern part), and the word is derived from the Chinese name of the silkworm see or sir. It is certain that the silkworm and its cocoon were known to both Greeks and Romans from the time of Alexander the Great's expedition to India (327 B.C.) and it is also certain that Chinese silk goods were not known to Southern Europe before the time of Julius Cæsar, who first displayed them in profusion at the theatrical entertainments he was in the habit of giving to the people of Rome. It was worn at first only by the highest and most opulent ladies of the city, being valued at its weight in gold. In the reign of Tiberias 14-37 B.C. the Roman senate enacted that no man should disgrace himself by weaving silk; this edict however was not strictly adhered to as the Emperors Vespasian 69 to 79 and Titus 79-81 both wore silken garments when they celebrated their triumph over Judea.

(To be continued.)

German Competition in the Levant.

Some time ago a number of German merchants visited several ports in the Levant, with the alleged object of establishing agencies there for the cultivation of a trade in German productions. Recently a paragraph has been in circulation stating that the merchants referred to have returned home and founded a company with a large capital to carry out the scheme, and promote the exportation of German manufactures of every description to the eastern Mediterranean countries. A general agency is said to have been established in the Piræus, where warerooms are to be taken for the display of German samples. Herr A. Rothschild, who has resigned his position as German Consul, is spoken of as the general manager. It is added that German industry is in this way to be enabled to compete energetically with English and French industry, and the promoters are said to feel sure that success will be easily attained. The *Allgemeine Zeitung* has no doubt that the Levant offers a field for German mercantile enterprise, and applauds the project as patriotic and practical, and as likely to be remunerative. Our Augsburg contemporary, however, has not yet learned from any German source that such a company has been actually formed, and is disposed to discredit the story on the ground that, notwithstanding the merits of the scheme, the condition of affairs, if not in Greece, at least in the neighbouring States of the Levant, is just now much too uncertain for it to be advisable to invest a large amount of capital there at present.

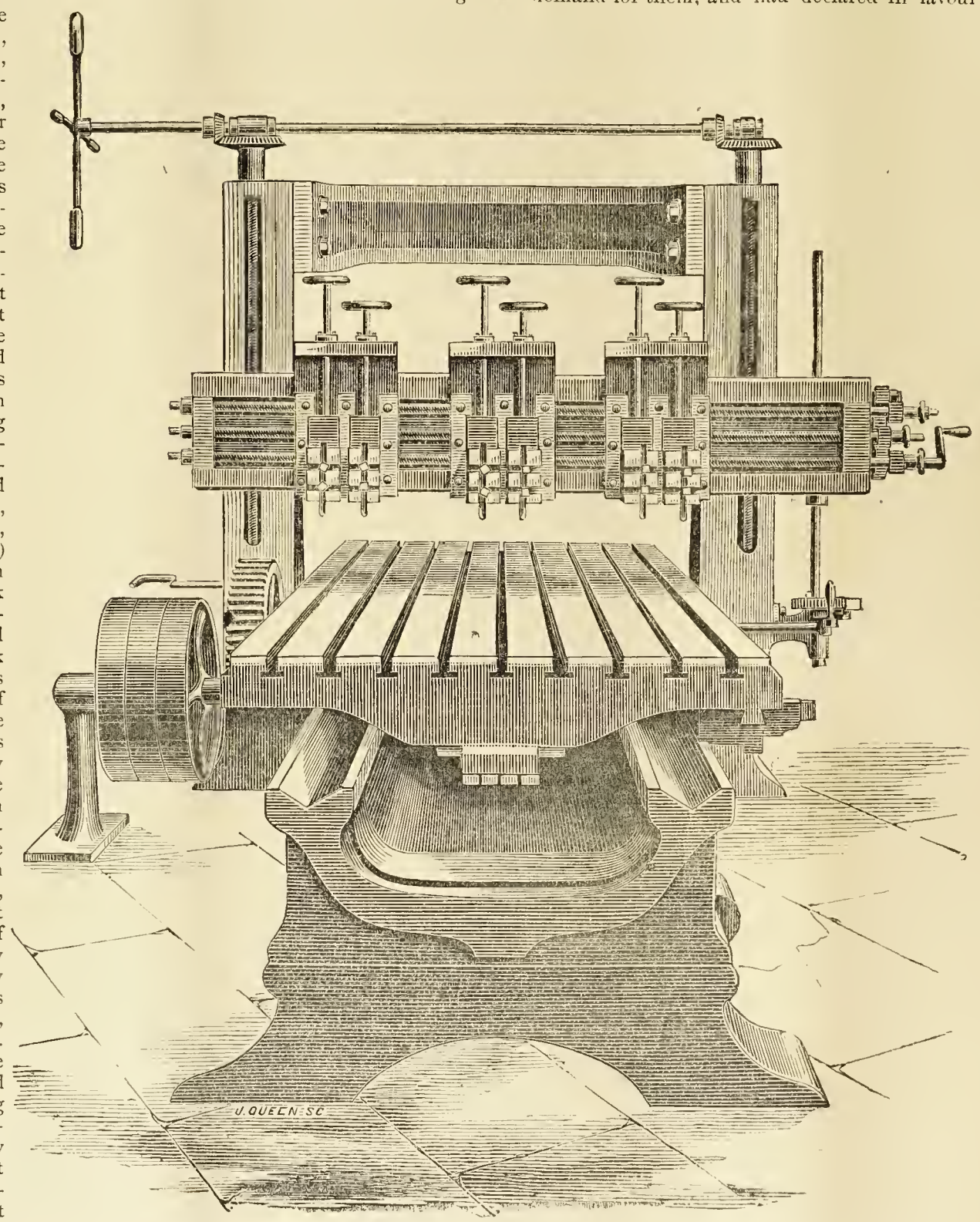
The Royal Commissioners Report on Technical Education.

The Royal Commissioners appointed to inquire into the instruction of the industrial classes of foreign countries in technical and other subjects have issued their first report. The Commissioners have come to the conclusion that the influence of the new laws enacted and proposed in France as to the diffusion of ordinary and superior primary instruction, both literary and technical, can scarcely be overrated. They commend the instruction in the use of tools during the elementary school age as tending to facilitate the learning of a trade, though it may not actually shorten the period of apprenticeship; and they would be glad to see this kind of instruction introduced into some of the elementary schools here. The Commissioners, however, do not recommend the introduction of apprenticeship schools—not, at least, until they have had a more prolonged trial abroad. The gratuitous lectures on literature and science given in all large towns in France are described as very valuable, and the art-teaching in that country is so carefully extended that the number of *bonâ fide* working men receiving practical instruction there is greater beyond comparison than it is with us. The Commissioners state that they have not at present made any further recommendations because they are only at the outset of their mission.

MACHINERY, TOOLS, ETC.

Messrs. Oldham and Richards' Machine Tools.

We have received a revised catalogue of Machine Tools suitable for engineers, machinists, shipbuilders, &c., from Messrs. Oldham and Richards', of the Red Bank Iron Works, Manchester. This firm, whose works we visited a few days ago, is one of the oldest established machine tool making concerns in England, and are makers of high-class lathes, planing, shaping, slotting, drilling, boring, and coach-spring making machines, and a variety of other labour saving tools. The Catalogue gives full particulars of the above-mentioned appliances and has evidently been prepared with great care. The plates have been well executed, and the descriptions are so numerous that with the limited space at our disposal, it would be impossible to give detailed particulars of the various tools made by this firm. An Improved Six-Tool Planing Machine, which we illustrate, deserves special mention. It has been designed for Cotton Machinists, &c., and is a very powerful one, with bed (accurately planed) and surfaced vees, table with slots, driven by step rack and pinion of the most approved form of tooth, and strong gearing, with a quick return motion. Uprights keyed and bolted to side of bed, and supported from the floor, carrying strong cross slide (adjustable to any height) with six tools to plane six rails at one time, each tool self-acting in the horizontal cuts. It has a simple and effective feed motion which is worked by friction, thereby rendering it almost impossible to break any of the feed wheels; a self rotary oiling arrangement, whereby the galling of the vees is rendered almost impossible, and screwkeys complete. We may add that for some years Messrs. Oldham and Richards' have made planing machines their great speciality, not only have they supplied some of the largest firms in the United Kingdom with these tools. but have also furnished them to different foreign governments, from many of which, we are informed, they have received the highest testimonials. The whole of these labour-saving machines are guaranteed to be of the best material, combined with first-class workmanship.



We have before us a number of declarations of dividends for the past financial year, by German textile manufacturing companies. The dividend of the Erlangen Spinning and Weaving Company (cotton) is at the rate of 6¾ per cent , against 5½ per cent. last year; that of the Dinkelsbühl Carded Yarn Spinning Company is at the rate of 4 1-12 per cent.—the same as last year; the Berlin Neuendorf Spinning Company has declared 2 per cent., against 7 per cent. last year; the Erdmannsdorf Spinning and Weaving Company (linen) has made a profit which would allow of a dividend at the rate of 1 per cent., but the Directors will recommend that the amount be written off against the depreciation account and that no dividend be declared; the dividend of the Ravensberg Spinning Company is at the rate of 4 per cent., against 5½ per cent. last year. The dividend of the Wurtemberg Cotton Spinning and Weaving Company of Esslingen is equivalent to 10¼ per cent.

The Bradford Trade.

The following extract is taken from a communication made to his Government by Mr. C. O. Shepard, the American Consul in Bradford:—

The original trade of Bradford was confined to goods made entirely from wool, but about forty years ago it was found that a mixture of cotton, in the form of a warp, with the worsted weft, made a variety of excellent, durable, and cheap dress goods. These goods had a great run for many years, and are still, in spite of adverse fashion, made in large quantities. They are never likely to die out entirely, as for certain purposes and for certain uses, they are preferable to goods made entirely from wool. For one thing, they are very much cheaper. Bradford manufacturers continue to make these goods, and in the same immense quantities, long after fashion had greatly lessened the demand for them, and had declared in favour of those made entirely from wool, with a dull soft finish. They have, however, paid dearly for their stubbornness, and are at last acting upon advice given long ago. They believed that as these goods had for so long a time sold easily and regularly they would always continue to be wanted, and large stocks were persistently accumulated which had finally to be cleared out at a heavy loss. The whole trade—manufacturers, dyers, and merchants—were too much wedded to old methods, which they insisted would pay and suit in the future, simply because they had in the past. I am glad to say, however, that the great majority of the trade is finally alive to the necessities of the occasion, and I believe that in the near future Bradford will make as fashionable all-wool dress goods as are produced anywhere. It is more disposed to adapt its productions to the demand of its customers than ever before, and it has given up expecting those customers to be content with any sort of goods which it thinks proper to offer them. . . . There is no doubt that Bradford was injured, even among her own countrymen, by the common prejudice in favour of French manufactures, because they were *foreign*. For other reasons there has been, in the past, plenty of justification for this prejudice, but it is hoped and claimed that very soon, in quality and durability, appearance and other points, there will be no better value to be had than in Bradford goods. Many new styles have been introduced, and many adaptations and improvements of old descriptions utilised, such as wool twills foulés, beiges, estaménes, serges, worsted coatings, and ladies' mantle cloths. Besides these, cashmeres and merinos have been so improved as to constitute almost a new trade, and beautiful dress goods, made from real cashmere hair and from Vicuna wool, are selling readily to the most opulent classes of buyers. A foulé, for instance, may be had with cotton warp, for 6d. per yard (12 cents), and with worsted warp for 8½d (17 cents). They are, at these prices, quite beyond competition from any other quarter. Beiges also, which used to be imported from France, are produced at similar prices, and are exported thither. Estamenes, a kind of serge, were formerly made in the West of England only, but within a few years Bradford has taken them up and made a large trade. Until lately they were only heavy, for ladies' winter mantles or cloaks, or for men's summer suits; but now lighter makes have been introduced, composed of finer kinds of wool, and principally used (as are foulés) for ladies' summer dresses. The increase is due to the widening of the range of qualities and weights, making them available for more purposes and for the wear of more people. Serges, both all-wool and with cotton warp, are a very old description, but they have been greatly improved of late, and are now very popular both for men's and women's wear. Many of them are slightly milled. The manufacture in Bradford of worsted coatings is a comparatively new industry. Not only is the production large,

but the varieties are great, and the perfection attained in fancy patterns ensures successful competition with Leeds and Huddersfield. They are preferable, for many uses, to the old double-milled West of England and Leeds cloths, and are also got up in styles suitable for ladies' mantle cloths. One variety is figured, and called "mattelasses." In all these new sorts of goods, Australian wool predominates.

The Spanish and Portuguese Tariffs on Cotton Goods.

As it is understood that a commercial treaty is likely to be concluded between this country and the Peninsular nations, a short account of the cotton trade of Spain may be found interesting. Cotton goods entering that country are subject to excessive tariffs, in the case of single yarns equal to the cost of the raw material, in the case of double yarns twisted in three or more threads equal to the value of the manufactured article in some cases. Calicoes are charged almost to the extent of the cost of the manufactured goods, indeed in some cases the duty exceeds the value of the article. Cords, velveteens, and other kindred makes pay a duty of 1s. 3¼d. per lb. It may be supposed that the reason for imposing these heavy duties is that a native industry has to be protected, no account evidently being taken by the Government of Spain as to the capability of Spanish cotton spinners for producing the cheapest article for clothing the people of that country. To give an idea of the magnitude of this native industry it may be stated that during the year 1881 the imports of cotton at Barcelona amounted to over 213,000 bales. The number of spindles in Spain is estimated to be about two millions, and taking the consumption of cotton fabrics by the population of Spain as equal to what it may be in some other European countries, it will be seen that with the frugal habits of the Spanish peasants the cotton manufacturers of Spain are almost able to clothe with native woven goods the population of that kingdom. The quantity of twist and yarn sent from this country into Spain only amounted to 178,000lb. in 1880, while the whole business done in piece cotton goods, lace, sewing thread, and all others amounted in value to a little over £400,000 in the same year. As far as the foreign trade of that country is concerned British cottons control to a great extent the Spanish markets. The exports of cotton goods from France to that country amount to about one half of those from Great Britain. Only one fifth of these, however, are French manufactured goods, the remainder being goods in transit through France from other countries. It will thus be seen that the Spanish cotton manufacturing industry is nearly equal to supplying the home demands. To protect an industry like this after such a manner as above described is practically for the Government of a nation to turn cotton spinners. It will be seen in the case of Spain that the result of this experiment is to protect incompetence and inefficiency, and for a cotton spinner to be in this position today is, to say the least of it, unfortunate.

Portugal does not appear to have any cotton industry of importance. There is, therefore, not the same excuse for Portugal taxing our goods as in the case of Spain. Nevertheless, single unbleached yarns have to pay a duty of 3·40d. per lb.; bleached and dyed yarns pay a duty of over 5d. per lb., while twisted yarns pay over 7½d. It is significant, however, that no twist or yarn appears to have been imported from this country. As regards manufactured goods, unbleached calico pays a duty of over 3d. per lb., moleskins dyed pay a duty of 5 68d., moleskins printed pay 10¾d. per lb., velveteens pay 5·68d., velvets over 11d. per lb. More than one half the total foreign trade of Portugal is with Great Britain, the exports of cotton goods from France to that country being only about £40,0000 in value per year, only one half of this amount being French manufactures, the remainder being goods in transit. The class of goods taken by the Portuguese is evidently of a low order, as the plain piece goods only average in value about 2¾d. per yard, and the printed goods something less than 4d. Why such heavy duties should be imposed as those maintained by Portugal it is not easy to understand, as the cost of collecting revenue must be something enormous compared with the value, the whole trade in cotton goods with this country only amounting to £800,000 a year in value.

Native Shipping in the United States.

It is quite natural that the protectionists of the United States should wish to subsidize native shipping. Protection has killed the ocean-carrying trade of the Union, therefore the taxes yielded by a protectionist tariff should be appropriated to the payment of bounties in order that this evil may be remedied. Peter must be robbed to pay Paul. The policy is quite intelligible, but we humbly submit that the measures proposed do not go nearly far enough. What is a paltry £500,000 to a trade that probably involves an overturn of £20,000,000 per annum in the direct trade of the Union with England alone? If British shipping is to be driven out of the carrying trade, the United States protectionists must go much further. We shall hardly gain an infinitesimal advantage from such a sum in the cheaper carriage of our goods, and our ocean liners will perhaps gain rather than lose by the stimulus which the subsidy may give to business. To be thorough, the protectionists ought to pay their ships as much money as would enable them to carry all cargoes, say, at one-quarter the present freight. This would compensate us to some extent for the weight of the tariff.

The Parcel Post.

The proposals for the parcels post have now been sanctioned by the Treasury. It is proposed that parcels should be posted at any post-office in the United Kingdom where letters are received, and that the postage being prepaid they should be delivered free of further charge wherever letters are delivered. The maximum weight will be 7lb., for which the proposed charge will be 1s., less rates of postage being charged for parcels of lower weight. If this inland parcels post is established it will immediately be linked with the international parcels post which is now in operation. This will enable parcels to be posted from any part of the United Kingdom to every other country in Europe except Russia and to Egypt and Asiatic Turkey. As an illustration, if the arrangements are carried out a parcel not exceeding three kilogrammes (about 6½lb.) may be posted in any part of the United Kingdom to any part of France for a charge which cannot exceed 1s. 9d. The *Globe* states that unexpected difficulties have arisen with respect to the proposed post. The negotiations with the railway companies, which at one time were progressing rapidly, have been almost entirely suspended in consequence of the exorbitant demands which have lately been made by the directors of several leading companies.

American Textile Exports.

The following table shows the declared value of the imports of the four principal classes of textile fabrics into the United States during the past two years :—

	1880.	1881.
	$	$
Cottons	32,670,113	31,592,874
Woollens	35,973,699	31,593,050
Silks	35,494,217	33,453,503
Flax manufactures	20,735,224	16,772,176
Total	124,873,253	113,411,603

Commenting on these figures, the *New York Commercial Bulletin* observes that textile goods now represent about one-fifth the total value of the merchandise imported into the United States : they provide about one-third the revenue collected from imports; and about 90 per cent. of the textile imports are received at New York. The decline of 9 per cent. in the value last year compared with the preceding year is attributed rather to the excessive imports of 1880 than to any decline in prices, such decline having had but a slight effect. Adding the duties (equivalent to 60 per cent. on woollens, 58 per cent. on silks, 38 per cent. on cotton goods, and 33 per cent. on flax goods , the value of the imports in 1881 would be increased by 55,000,000 dols., raising the total to 168,500,000 dols., or 25,000,000 dols. more than the value of of the entire production of the cotton mills of the Eastern States. "This," says the New York paper sarcastically, "is a fair illustration of our independencies of foreign

supplies through the beneficial effect of our protective system!" Nearly one-half of the total textile imports were sent from Great Britain, the bulk of the remainder being received from France, Switzerland, and Germany. The value of the dress goods received from Great Britain was twice the value of these goods received from France. A still more remarkable fact is that the average value of the British goods was higher than the average value of the French, the figures being 22 2c. and 20 7c. per yard respectively. Great Britain supplied to the United States last year about 40,000,000 yards of dress goods, against 17,500,000 yards from France. Nearly all the linen goods were sent from Great Britain, and more than one half the cotton goods also. Germany sent a considerable proportion of the cotton goods, while France furnished the largest proportion of silks and other fine textiles. This latter fact makes the relatively higher average cost per yard of the British fabrics exported somewhat phenomenal.

ODDS AND ENDS.

Attention is called in a foreign contemporary to the efforts now being made in Italy to reduce the time required for bleaching linens on the grass to a period of fifteen days, and to the application to this trade in the north of France of a chemical process of Italian invention. The white obtained by this process is said to be equal to the best Irish bleach, and to be capable of being produced in eight days without any grass bleaching, and without altering the strength, the grain, or the feel of the cloth.

* * * *

On the 17th ult., the Act (45 Vict., cap. 2) was issued to authorize the use of reply post cards. It is to be cited with the other Post-Office Acts. The highest rate for an inland post-card is not to exceed one halfpenny, and a reply post-card not to exceed double the rate charged for an ordinary post-card. The reply post-card may be transmitted by the person receiving it, or a part thereof without further payment. A reply post-card or part again transmitted without further payment to be deemed a postal packet.

* * * *

The manufacture of thick cotton cloths has long been followed in China, but a new attempt has lately been made in the direction of woollen goods. A woollen factory having been started three years ago by the Governor-General, Tso Tsung t'ang at Lan Chowfoo, in the province of Kansuh, the district being a remote one, to which European machinery was carried that is driven by two small steam engines, the produce being about 136 yards of cloth daily. Native wool is supplied to the factory, the material produced being cheaper, but of inferior quality to that imported into China from Europe.

* * * *

The German Society for the Promotion of Industry offers prizes of various values, from £25 to £300, in connection with the following subjects: —Isolation of the textile fibres from nettles, and removal of the plant gum; manufacture of vessels for transport of nitric acid; investigation of photographic pyroxylin; spark-arresting and spark-extinguishing apparatus for locomotives, &c.; fire-proof furnace-lining material, with earthy base; anthracite extraction; the German paving-stone industry; chemical examination of glass fluxes of Italian enamels and mosaics; German hemp cultivation and industry; the laws of ductility.

* * * *

It has been proposed to make a difference, with regard to the payment of Income-tax, between industrial earnings and the profits of capital. Mr. Hubbard, M.P., in his bill on Income-tax administration, would entitle industrial earnings to an abatement of one-third before assessment. Where labour is applied to the use of capital, the industrial earnings to be entitled to the abatement would be taken as the net profit after deducting from it the interest at 4 per cent. on the capital. The bill would also make the Income-tax with regard to lands and houses charged on the ratable value —that is, on the value of the occupation after deducting from the gross value all outgoings necessary to maintain the hereditament. Another clause of the bill deals with annuities, and would exempt from Income-tax any portion that may really represent the repayment of capital.

* * * *

The compulsory provision of life preservers on steamers, and thier manifest utility, suggests to a correspondent the propriety of a law compelling factory owners to provide at each window a cheap and efficient fire escape, in addition to the appliances and stairways now required. One that would always be ready, easily understood, and usable by any person of ordinary intelligence, even under excitement, could be made in the following manner: To a staple firmly driven in the wall immediately over each window attach a rope or cord, say three-eights of an inch in size, and long enough to reach nearly or quite to the ground. This cord should be well made and pliable, and might be knotted at intervals of about fifteen inches. The cord should be then rolled into a coil or ball, and tied in place by a small cord or strap, ready at a moments notice to be untied and the end thrown out of the window. Men, and even women, could descend it with little difficulty, or the stronger and cooler-headed could tie the rope about the bodies of the weaker and quickly lower them to the helpers below.

The compound of india rubber and asbestus, which is to some extent a new combination, is now used for packing for valves, its peculiar properties rendering it particularly fit for this purpose. For range valves or high-pressure hot-water cocks, it appears invaluable. As it contains no wire it can be cut to any required size, and will stand any temperature; at present it is used most for packing steam joints and large valves.

* * * *

The Calico Ball at Glasgow has been *the* sensation of the period in Scotland, *the* event of the season. So great was the rush for admittance that the tickets, originally issued at five guineas, were raised to fifteen guineas, and so far was this price from proving prohibitive that applicants had to submit to the ballot. It is, then, no matter of surprise to learn that the ball was, in every sense of the word, a success; that over a thousand guests gave grace to a scene of which it is said that "imagination could not have suggested anything that would have enhanced the splendour of the picture it formed," and that—more to the point—a surplus of something like £2,500 is estimated as likely to accrue to be devoted to the infirmaries on behalf of which it was held.

* * * *

A meeting of the association for the removal of Protection from Indian mauufactures was held last month at Hanover Chambers, King Street, Manchester, for the purpose of dissolving the association, the object for which it was originally formed having been attained. The thanks of the association were given to the Marquis of Hartington and the Government of India for the broad and statesmanlike measure by which Protection had been entirely removed from the fiscal system of India, and its commerce placed on a Free Trade footing; and also to the Marquis of Salisbury for having initiated the policy of reducing the Indian import duties on cotton goods and yarns, and for his consistent and forcible advocacy of the removal of this obstruction to our trade with India. It was further resolved that the balance at the credit of the association, after paying all liabilities, be handed to Captain Hobbs, whose services as secretary entitled him to the cordial thanks of the meeting. A resolution having been passed dissolving the association, the meeting terminated.

THE GAZETTE.

Adjudications of Bankruptcy.

Hill John, Samuel McMaster, and Alfred Thomas Plant, trading as Hill, McMaster, and Plant, Mosley Street, Manchester, and Williamson Street, Liverpool, manufacturers and merchants.

Liquidations by Arrangement or Composition.

Higgin William, trading as William Higgin and Co., Middle Pavement, Nottingham, lace and hosiery yarn agent.
Huddlestone William, Cannon Street, Manchester, and Stratford, commission agent and yarn merchant.
Pickford James, trading as James Pickford and Son, London Mills and Pickwood Road, Derby Street, Leek, Staffs, silk manufacturer.
Binns Arton, and James Edward Wadsworth, trading as Wadsworth, Binns, and Co., Mabgate Woollen Mills, Mabgate, Leeds, woollen manufacturers.
Pearce John Henry, Hounds Gate, lace frilling manufacturer, Nottingham.
Dickinson Henry, trading as Marshall and Dickinson, Forth Lane and Westgate Road, both Newcastle, woollen merchant.
Hall Benjamin, Longwood, near Huddersfield, mill owner and woollen manufacturer.
Hampson Alfred, Fairfield, near Manchester, cloth finisher.
Shackleton William, Spring Wood Mill, near Todmorden, cotton spinner and manufacturer.
Driver Rhodes, East Morton, Bingley, Yorks, stuff manufacturers.
Turner Abraham, Elland, late Wheatley, both near Halifax, cloth puller and finisher.

Sequestrations.

Walker William and Co., Boyne, Banffshire, and Hugh Stein and William Kerr Walker, the partners and as individuals, manufacturers.
M'Arthur Robert, Stockwell Street, Glasgow, woollen warehouseman.
Watt George Henry, trading as Johnson, Watt and Co., West Nile Street, Glasgow, yarn merchants.

Trustees Appointed.

Culpan Nathan and John Cockroft, trading as Andrew Pickles and Co, (Liquidation), Sowerby Bridge, woollen manufacturers. Trustee, M. Brown, Halifax, woolstapler, and A. Briggs, Sowerby Bridge, accountant.
Culpan Nathan (Liquidation), Sowerby Bridge, woollen manufacturer and innkeeper (separate estate). Trustee, A. Briggs, Sowerby Bridge, accountant.
Whiteley Samuel (Liquidation,) Rastrick, Halifax, woollen manufacturer. Trustees, J. Nutton, West Vale, near Halifax, wool dealer, and J. S. Saville, Dewsbury, shoddy merchant.
M'Arthur Bros., Alva, woollen manufacturers. Trustee, T. C. Gray, Alva, factor.
Calvert William (Liquidation), York, woollen merchant. Trustees, J. W. Close and J. Hardcastle, both Leeds, accountants.
Ingham Richard (Liquidation), Sowerby Bridge, cloth finisher. Trustee, A. Briggs, Sowerby Bridge, accountant.

Dividends.

Brook Joah (Liquidation), Brighouse and Bradford, stuff manufacturer. 1st and final dividend, 7s.; W. Glossop, 33, Kirkgate, Bradford.
Kendrick Henry B. (Bankrupt), Basinghall Street, woollen cloth merchant. 1st dividend, 5s.; on and after March 8; W. Walker, 34, Coleman Street.
Lord Thomas, trading as Matthew and Lord (Liquidation), Wardle, near Rochdale, woollen manufacturer. 2nd and final dividend, 2s. 5d.; S. Stott, 88, Tweedale Street, Rochdale.
Tempest Isaac, William Turner, and Daniel Hopkin, trading as Isaac Tempest and Co. (Liquidation), Bradford, worsted spinners. 2nd and final dividend, 1s. 10d.; on and after March 13, between 10 and 4; Tempest and Hewson, accountants, Bradford.

Bills of Sale.

Dade Daniel H., 22, Keston Road, East Dulwich, silicate cotton maker, for £104 18s. 9d., to George Dibley and another.
Spencer John, 29, Half Edge Lane, Eccles, Manchester, linen agent and manufacturer, for £60, to James Fildes.
Crook Benjamin, Foster Mill, Wadsworth, near Hebden Bridge, cotton spinners, for £1,500, to James H. Smith.
Dewhirst William Archibald, and John Dewhirst, Salford Bridge Mills, Clitheroe, Lancashire, cotton spinners and manufacturers, mortgage for £12,500, to Thomas Watson.
Newsome Charles, 64, Jersey Street, Ancoats, Manchester, cotton manufacturer, for £100, to Francis S. Cuff.
Bridgewater John Thomas, Fairfield Mills, Cleckheaton, and Francis Foster Bridgewater, of the same place, cloth manufacturers, for £2,300, to Mary A. Dale and others; property also at North View Terrace, Hunsworth Moor, and at Spring Mount Villas, Cleckheaton, in the respective occupation of the mortgagors.

Dissolution of Partnerships.

Marshall Andrew, London Street, Glasgow, cotton yarn merchant. The business transferred to J. Legate and W. Parker.
Gregory, Thomsons and Co., Kilmarnock, carpet manufacturers, &c. As regards P. P. Turner and James Triggs.
Laughland, Roxburgh, and Co., Townholm, Kilmarnock, wool spinners, &c. Debts by Alexander Dunsmore, who with Robert Gemmell, continues the business as Gemmell and Dunsmore.
Batley Josiah and Son, Marsh, Huddersfield, cloth finishers.
Blackburn, Tolson, and Co., Heckmondwike, woollen manufacturers. As regards John Blackburn.
Firth E. and Sons, Flush Mills, Heckmondwike, spinners and manufacturers.
Hodgson and Howe, Elland, Halifax, cotton doublers. Debts by Jonathan T. Hodgson.
Holden and Holt, Halifax, silk spinners Debts by George Holden.
Horsfall J. and Co., Sowerby Bridge, woollen manufacturers. Debts by John Horsfall.
Lister J. and R., Keighley, angola and stuff manufacturers. As regards Bruno Arno Porzig.
Mellor Thomas and Sons, Ashton, cotton spinners and manufacturers.
Pickup and Lord, Rochdale, cotton twill manufacturers. Debts by Edmund Pickup.
Roberts and Haigh, Bottoms, near Holmfirth, dyers.
Robertshaw Abraham and Sons, Stansfield and Hebden Bridge, cotton waste spinners. As regards Abraham Robertshaw.
Snowden A. & Co., Cleckheaton and Bradford, worsted manufacturers. As regards Henry Snowden.
Taylor S. and R. Bury, bleachers and dyers. Debts by Radcliffe Taylor.

PATENTS.

Applications for Letters Patent.

83 John McNaught, and William M'Naught, jun., St. George's Foundry, Rochdale, engineers and machinists, "Improvements in or applicable to machinery for scouring and washing wool and other fibrous materials."
1008 Thomas Singleton, Darwen, machine maker, "Improvements in looms for weaving."
1016 John Darling, Glasgow, "Improvements in apparatus for measuring cloth or other webs."
1030 Charles Denton Abel, 28, Southampton Buildings, Chancery Lane, Middlesex, "An improved manufacture of colouring matters for dyeing and printing,"—A communication.
1090 Enoch Openshaw Taylor, Marsden, ironfounder, and Thomas Brierley, Marsden, in the employment of the said Enoch Openshaw Taylor, "Improvements in apparatus employed in weaving."
1091 David Bailey, Yews, Lockwood, loom turner, and now in the employment of Messrs. Robert Taylor and Sons, of Marsden, near Huddersfield, "Improvements in looms for weaving."
1092 Thomas Priestley, Bradford, stuff manufacturer, "Improvements in machinery and apparatus employed in knitting machines."
1102 Calder Hurst Clegg and Abraham Hoyle, Littleborough, Lancaster, "Certain improvements in looms for weaving."
1103 Abraham Holden, Gorton, mill manager, "Improvements in carding-engines."
1118 George Burslem, Stockport, "Improvements in pickers used in looms for weaving and in attaching picking straps thereto."
1119 Thomas Hall Wharton and Frederic Farrar, Bradford, machine wool combers, "Improvements in machinery for combing wool and other fibrous substances."
1141 James Dobson, carding master to Messieurs William Roberts and Company, Galashiels, "Improvements in carding machinery."
1159 Arthur Charles Henderson, 6, Southampton Buildings, Holborn, "Improvements in dressing, finishing, and lustring stuffs, and in apparatus in connection therewith."—A communication.
1179 Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in machinery or apparatus used in dyeing."—A communication.
1217 Nathaniel John Holmes, The Hall, Primrose Hill Road, London, Middlesex, "Improvements in bleaching vegetable fibres, textile fabrics, and liquids."
1233 Alfred Julius Boult, of the firm of W. P. Thompson and Boult, agents for Foreign Patent Solicitors, 323, High Holborn, London, Middlesex, and 6, Lord Street, Liverpool, "Improvements in needle woven tapestry and in fabric therefor."—A communication.
1256 Luke Greenwood, Hawick, North Britain, manufacturer, "Improvements in or connected with looms for weaving."
1273 Thomas Knowles, Blackburn and Over Darwin, cotton spinner and manufacturer, "Improvements in Looms for weaving."
1297 John Imray, 28, Southampton Buildings, Chancery Lane, Middlesex, "Improvements in the manufacture of printed fabrics."—A communication.
1310 William Henry Beck, 139, Cannon Street, London, patent agent, "Improvements in circular bobbin-net machines."—A communication.
1329 Robert Bailey, manager, and William Walker, Ovenden, Halifax, both in the employ of the Ovenden Worsted Company, Limited, and Louis John Crossley, carpet manufacturer, Halifax, "Improvements in the manufacture of certain woven fabrics."

1339 George Rydill, Sheffield, "Improvements in utilizing woven or knitted woollen, worsted, or silk fabrics or material in the manufacture of reversible plain and fancy cloths, worsted coatings, rugs blankets, table-cloths, damask, carpets. woollen, worsted, and silk hosiery, hanks, yarns, and other textile fabrics by hand or power."

1374 James Stansfield, manager, Colne, "Improvements in looms for weaving."

1370 James Moss Howson, Drighlington, near Bradford, worsted spinner, "Improvements in spinning machinery."

1411 Robert Crowther Sykes, Cleckheaton, worsted spinner, "Improvements in flyers employed in spinning and twisting wool and other fibres."

1419 Frederick Ripley, spinner and manufacturer, and Thomas Hargreaves Brigg, machine maker, both of Bradford, "Improvements in machinery for spinning fibres."

1433 John Lewthwaite, of 5, Carlton Place, Halifax, "Improvements in rollers for washing, printing, spinning, carding, and other like machines, and in the manufacture of belts for machines and other purposes, such as covers or cloths for tables, chairs, seats, in imitation of leather."

1446 John Wain, foreman in the employment of Messieurs Curtis, Sons and Co., of Manchester, "Improvements in mules and twiners."

1447 John William Hepworth, of Churwell, near Leeds, cloth dyer, "Improvements in machinery for dyeing textile fabrics."

1473 Edward Hirst Wade, of Bradford, spinner and manufacturer, "Improvements in the manufacture of moreen fabrics."

Grants of Provisional Protection for Six Months.

535	734	757	773	782	785	807	841
863	867	868	876	881	884	886	895
899	908	919	935	936	951	983	1008
1090	1102	1115	1118	1119	1159	1179	1214
1217	1233	1243	1244	1256	1262	1273	1286
1310	1337						

Notices to Proceed.

304	323	423	447	478	543	733	735
785	867	876	886	899	902	983	1141
1157	1245	1337	4781	4815	4844	4846	4944
4960	4986	5031	5059	5089	5110	5114	5134
5135	5142	5155	5178	5188	5203	4218	5258
5388	5691						

Patents Sealed.

152 Edwin Boden, of Manchester, "Improvements in the construction of apparatus for dyeing or washing hanks of yarn cord or braid."

223 Charles Wilden King, engineer, of 33, Bury New Road, Manchester, "Improvements in gas-motor engines."

932 Theophilus Hanson, Bradford, mechanic, "Improvements in looms for weaving."

3854 Benjamin Norton, of the firm of Norton Brothers and Company, Limited, Nortonthorpe, near Huddersfield, manufacturers, and Crossley Turner, of the same place, yarn manager, "Improvements in the method and apparatus for making clouded, flaked, or spotted yarn."

3892 John Henry Allin, Edgware Road, Middlesex, draper, "Improvements in ornamenting linoleum, kamptulicon, oil-cloth for covering floors, and other similar fabrics."

3935 Isaac Buckley and Edwin Crossley, both of Dunkinfield, "Improvements in machinery or apparatus for spinning and doubling cotton and other fibrous materials."

3962 Thomas Coltman, Leicester, "Improvements in machinery and apparatus for producing open fabrics and embroidered close and open fabrics."

4056 John Erskin, Sion Mills, Strabane, Ireland, "Improvements in wet spinning frames."

4112 John William Stringer, Bradford, mélange printer, "Improvements in apparatus for printing colours on fibres and fibrous substances."

4129 John Bastow, Bradford, spinner, "Improvements in apparatus for spinning, doubling, and preparing cotton, wool, flax, silk, or other fibres."

4140 Thomas Howard Blamires, Huddersfield, manufacturer, "Improvements in mules for spinning wool, cotton and other fibres."

4272 John McNaught and William McNaught, junior, St. George's Foundry, Rochdale, engineers, "Improvements in machinery for scouring and washing wool and other fibrous materials."

4524 Frederick William Borland, Flixecourt, in the department of the Somme, France, "Improved apparatus for collecting and removing the dust produced in carding flax. hemp, or other fibrous materials."

5029 William Lloyd Wise, 7, Whitehall Place, Westminster, "Improvements in the manufacture or production of felts and like products or materials, and machinery or apparatus employed therein."—A communication.

5725 Michael Barker Nairn, Kirkcaldy, "Improvements in machinery for the manufacture of linoleum and like fabrics."

Patents on which the Stamp Duty of £50 has been Paid.

842 Thomas Coltman, Leicester, "Improvements in machinery and apparatus applicable to spinning-frames, to prevent waste and double yarn."

846 Isaac Holden, of the firm of Isaac Holden and Sons, machine wool combers. Bradford, "Improvements in apparatus employed in combing wool and other fibres."

870 Alexander Melville Clark, Chancery Lane, Middlesex, patent agent. "Improvements in spinning machinery."—A communication.

906 William Turner, Bradford, spinning overlooker, "Improvements in machinery or apparatus for spinning, twisting, or winding worsted, cotton, and other fibrous substances."

918 John Collins and John Brownlee, Glasgow, "Improvements in looms for weaving."

944 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in apparatus for opening, weighing, and otherwise preparing textile materials, and supplying the same to carding and other machines."—A communication.

1466 James Rollinson, Dewsbury, power loom turner, and John Senior, Dewsbury, power loom turner, "Improvements in looms for weaving."

1217 Alfred Topp, of the firm of Messieurs Topp and Hindley, of Farnworth, spinner and manufacturer, "Improvements in the manufacture of certain woven fabrics."

1179 William Wild and Thomas Wild, both of Stewarton, in the county of Ayr, frame smiths, "Improvements in machinery for the manufacture of Scotch bonnets and other knitted fabrics of circular form."

1252 Charles Hughes, of Kidderminster, carpet manufacturer, and Wm. Henry Bairstow, of Kidderminster, mechanic, "Improvements in looms for weaving ornamental velvet-pile, Brussels, and tapestry carpets, and other like fabrics."

Patents on which the Stamp Duty of £100 has been Paid

784 John Whyte, Glasgow, machine agent, "Improvements in looms for weaving."

1111 Edward Buckley, foreman in the employment of Taylor, Lang, and Co., Limited, Castle Iron Works, Staleybridge, "Improvements in openers and lap machines for preparing cotton and other fibrous materials."

1294 James Worrall, Manchester, dyer, "Improvements in the mode of and apparatus for colouring pile fabrics."

Copyright of Designs.

(Registered during March, 1882.)

Class VI., Carpets.

377,794-96	The Heckmondwike Manufacturing Company (Limited), Heckmondwike, Yorkshire.
378,002	H. and M. Southwell, Bridgnorth.
378,124	H. R. Willis and Co., Kidderminster.
378,171-72	Thomas Hoyle and Sons (Limited), Manchester.
378,200	Cooke, Sons, and Co., London and Liversedge, Yorkshire.
378,206	The Heckmondwike Manufacturing Company (Limited), Heckmondwike.
378,489-90	Knaught and Co., Leipzig, Germany.

Class XI., Furnitures.

377,479	S. and F. Sternberg, 39, Dickinson Street, Manchester.
376,500	Alexander Drew and Sons, 15, Nicholas Street, Manchester, and Lower House, Burnley.
377,565	Jauffred and Gabriel, 10 and 12, Dickinson Street, Manchester.
377,735	George Andrew and Sons, Compstall and Manchester.
377,787-88	Weiss Fries, Mulhouse, Alsace.
377,950-51	Thomas Hoyle and Sons (Limited), Manchester.
377,971	Alexander Drew and Sons, 15, Nicholas Street, Manchester, and Lower House, Burnley.
378,010	Robinson and Co., Isle of Cinder, Swinegate, Leeds.
378,053-54	S and F. Sternberg, 39, Dickinson Street, Manchester.
378,055	Thomas G. Hill and Co., 86, Major Street, Manchester.
378,061	Stead, McAlpin and Co., Cummersdale, Carlisle.
378,148	McNaughtan and Thom, Birkacre, near Chorley, and 42, Portland Street, Manchester,
378,149-50	Reiss Brothers, 11, Quay Street, Manchester.
378,207	Thomas Hoyle and Sons (Limited), Manchester.
378,270-93	Weiss Fries, Mulhouse, Alsace.
378,433-34	Thomas Hoyle and Sons (Limited), Manchester.
378,460	Thomas Lee and Co., Fountain Street, Manchester.
378,499	Boden, Terras, and Co., Manchester.
378,507	William Watson and Co., 60, George Street, Manchester.
378,628-29	Daniel Lee and Co., Fountain Street, Manchester.

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A Design for a Linen Damask Table Cover.
Original Coating Designs.
Dunham's Patent Power Hammer.

Notices.

The Half-Yearly Subscription—payable in advance—including home postage, is 3s. 6d. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 3, Gerrard Street.

The Publishers will be happy to receive intimations of New Inventions, Patents, &c.

The Publishers are open to receive from Designers, Original Designs of Carpets, Damasks, Tapestries, Linen, Cretonnes, &c., and such as are accepted will be published with the Designers name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

Literary communications must, in all cases, be accompanied by the names and addresses of the writers, not necessarily for publication, but as evidence of authenticity.

Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics* for publication, will be considered as offered *gratuitously* unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers in making enquiries of, or opening accounts with Advertisers in this paper, will kindly mention the *Journal of Fabrics* as the source from whence they obtained their information.

To our Readers.

Numerous inquiries having been made for back numbers of the Journal, we beg to inform our readers that all the numbers from the commencement to February are out of print. We have however reprinted our designs and have a stock of 18,000 copies on hand, which we shall be happy to supply in the order in which they were originally published, at 6d. per set, each set representing one month's issue.

* * * *

The continuation of the article on Technical Education is unavoidably held over until the next issue.

The Furniture Exhibition at the Agricultural Hall.

OPINIONS at present vary considerably amongst English manufacturers of different classes of goods, as to the utility of Industrial Exhibitions, especially in respect to those held in foreign countries to which they are asked to contribute specimens of their manufactures. Numbers express the opinion that the foreigner has been taught sufficient during the past generation, in fact a little too much; this to a great extent may be true, but on the other hand a great deal of knowledge of vast importance to our industries has undoubtedly been gained in return during the past few years. But whatever may be expressed in reference to exhibitions abroad, we think that Industrial Exhibitions at home ought to be encouraged by our manufacturers, as far as is practicable with their engagements. The Exhibition in connection with the furnishing trades, which was opened on the 1st instant in the Agricultural Hall, Islington, has a very satisfactory display of cabinet-maker's work of a high class character, although what may be termed the notable maker's are almost unrepresented. It is a matter of surprise to us that manufacturers of carpets, tapestries, laces and other fabrics, which play such a prominent part in the furnishing of every house of moderate pretensions should be conspicuous by their absence. One or two firms have certainly come forward, and as though to make up for the absence of others in the trades, have made really excellent displays of their manufactures. Mr. Gower Woodward of Kidderminster, exhibits a number of carpets and curtains made from camels hair, which can be produced at a very low figure, and also the "Brandenburg" carpet, a new fabric similar in appearance to Brussels. Messrs. Graham, Grossmith and Co. of London, show a number of Brussels and Wilton carpet—squares of good designs and colour, and an "Indian" carpet manufactured by Messrs. Barbour and Millar of Glasgow which is exceptionally noticeable. The largest display, and certainly the most interesting one, is that of Messrs. Cardinal and Harford of the Levant Carpet Warehouse, High Holborn, London. This firm exhibits some of the choicest specimens of Turkish, Persian, Indian and Kelim carpets and rugs; all of which are of exquisite design and colour, and with one or two exceptions are of genuine native manufacture. Visitors to the Exhibition will be struck, not only with the beauty, but also with the great variety of Oriental floor coverings shown by this firm, although the space allotted to them is badly lighted; were there even a shade better light the beauty of this interesting display would be greatly enhanced. There are some good specimens of Tapestry and Jute curtains in the Exhibition, but these are used as hangings or adornments by the various exhibitors of furniture. The hangings used by Messrs. T. G. Vaughan and Co., and those by Messrs. Blyth and Sons, are capital examples of cheap materials in good designs and colours. Those of the latter firm are worthy of special mention, being styled "Woollen Tapestry," and being of a broad, flat, ribbed material of German manufacture, with a pattern of horizontal stripes. Printed Jute curtains are used by many exhibitors, which are mostly effective productions. The Lace industry is represented by a solitary specimen, that of the "Duplex" curtain. The "curtain" is a combination of a pair of curtains and valance made in one piece. A variety of these are shown, many of which have elaborate designs.

It will be seen from this brief notice that only one manufacturer of carpets puts in an appearance at the Exhibition. We might ask where are the manufacturers of Kidderminster, Halifax and other carpet producing centres? In tapestries, woollen and silk fabrics, damasks, &c., not a single firm is represented, whilst lace goods, as before remarked, are only shown by one firm. One would have thought that a good display of cretonnes would have been made, but not a single exhibit was displayed in the Exhibition, not even from Manchester the great centre of the calico printing industry.

The Canadian Trade Tariff.

Canada has lately increased her tariffs, not, however to prohibition, but just to the point of meeting urgent requirements. The greater capital and producing power of the United States enabled them to flood her markets with surplus produce at prices which not merely checked, but threatened to destroy valuable branches of trade. This caused very general depression and which in its turn checked immigration from Europe, and caused migration to the States. The present result of the new policy is that existing manufactories are extending, and new ones are springing up, immigration is increasing, capital is growing in the country itself, and flowing in from without for railroads and other undertakings of great importance, which are laying a wide and sound basis for the development of the resources and power of the Dominion. Advocates of free trade who have seen Canada under her old and her new policy, and even opponents of the new policy admit that at present it is working favourably, and whilst they adhere to the general principles of free trade, cannot deny that, sound as they are, there may be exceptions, and that Canada is one.

Botanical Science in its Relation to Ornamental Art.*

(*Continued from page* 88).

NATURE, too, will aid us no less in colour suggestions than in form suggestions. The rich tints of the autumn—the brilliant yellow of the dying maple, the bright crimson of the herb robert, the variety of browns, yellows, crimsons, in the foliage of the bramble, are all full of suggestions to the designer, while the quaint forms and sombre richness of tint of the seaweeds are in themselves a grand field still waiting to be worked. Many other good ideas for colour arrangements might be suggested, but my desire is to whet your appetites and send you searching for yourselves, that your own eyes may see the beauty that is in every summer hedgerow, rather than to spoil its grace for you by mere verbal descriptions on this winter's night. Things that repeat mechanically and frequently should be conventionalised. It is an insult to the infinite variety of nature to repeat at every few inches the same bunch of roses. Hand-work, on the contrary, may justly be varied, and even if we confine ourselves to our roses, we are able to introduce a sufficient modification in the grouping to prevent the tedious sense of samenesss. Where, in addition to the inevitable necessity of repetition, the exigencies of manufacture, as in weaving, prevent any accurate representation of natural forms, conventionalism should again be resorted to. It may be of very varying type in its departure from nature, but where everything has to be worked in squares and to have outlines like flights of stairs, a fatal bar is placed in the way of adequately representing the graceful beauty of nature. It is surprising to see how near an approximation may sometimes be gained by a cleaver designer under so painful a limitation, but the struggle is too unequal after all, and can only be at all tolerated where the squares are so small that at a little distance the eye fails to perceive them. * * * All work done under Mohammedan influence is compulsorily conventional, for the code of Islam forbids the representation of any natural form. Shut out from all contact with nature, their artists devised works of exceeding richness. Yet they owed their charm to the intricacy of their design, and the richness of their colouring, and after the first feeling of wonder at complex arrangements, and of pleasure at their scheme of colour is over, we turn from them unsatisfied. Japanese art is now fashionable, and we may but seem to be joining in the general applause, yet how delightfully fresh one at once feels it. We must bear in mind too, that this popular applause, though in some cases of little or no critical value, springs from the true estimation first expressed by those whose opinions really were worth regarding, and this esteem will remain when the votaries of mere fashion have deserted Japan and all its ways, and raised another idol on the empty throne; for the art of these people is no dead thing, but a vital force, instinct with appreciation of all the beauty and quaintness of nature. Technically, too, these people can draw; they have both the observant and appreciative eye, and the ready hand, no complexity of structure, no sharp foreshortening is shirked by them, and all the beauty that their eyes delight in, their hands unfailing transfer to paper. The designer should not rest contented with being a "student," knowing nothing of the hedgerows that surround him at a very short railway ride, but sally forth, note book in hand, well persuaded that even the roughest sketches made from living nature are a most valuable stock-in-trade. I always impress this point strongly on my own resident studio pupils, budding designers, and all upon whom I can exercise any influence. * * * I have myself, when designing for manufacturers, found the immense advantage of a well-filled drawer of them In making such sketches, all the salient points should be seized, and as much of the life history of the plant given as possible; one should see the opening bud, the blossom in all the glory of its full expansion, the fruit follows it. All modifications and varieties in the form of foliage should be noted, and the way the flowers are arranged on the stem should be given. Very often, too, the sections of either stem or fruit will give admirably suggestive forms, and then these, too, should be carefully added. As examples of stem sections, we may give the *Carex vulpina*, the *Alisma plantago*, and the *Spiræa ulmaria*—a kind of sedge, the great water plaintain, and the meadow sweet. Amongst fruit sections, we may notice the primrose, the snowdrop, the *Vellozia elegans*, and the hemlock. It is evident that many of these natural forms might, with very little modification, suggest ornamental arrangements, either the section of the primrose or the snowdrop, being as they stand, very suggestive of some of the Greek patera forms. The forms of the flowers are no less suggestive, giving us, as they do, many beautiful examples of radiate and symmetrical forms. * * * The inflorescence of the plant, the way in which the flowers are arranged, is another feature that may well be studied by the designer. Some flowers, as the snowdrop, rise singly, and stand alone on the summit of their stalks; others, as in the hyacinth or the foxglove, make a long line of blossoms, fringing the stalk that supports them all; others again, as in the flowering rush, form what is termed an umbel, and all spring fan-like from one point, a peculiarly beautiful arrangement for decorative work. The arrangement of the leaves too, is another feature to be noticed. In many plants, as the laurel and the pivet, they grow in pairs. In many cases, again, as in the ivy, the leaves grow alternately, while in others, as the cleavers or the woodruff, the leaves grow in a ring. The forms of leaves vary very considerably in various parts of the same plant, the lower ones being often less richly cut than the upper: the marsh mallow affords us a good illustration of this; while in other plants, as the avens or the buttercup, the reverse is seen. In many plants, too, the earliest or root leaves are of a quite different form to those that succeed them. This fact must be well known to any one who has ever sown mustard or radishes. The sunflower and sycamore give other good illustrations of this feature, and it is needless to dwell on its decorative value. Allow me, in a few closing words, to commend to all designers the great importance of such a study of nature as I have here indicated. Believe me, the hours so spent are no lost time. Books are often ransacked for illustrations, but the aid they afford is as nothing compared to the sketches one can make with the living plant before one. I am, of course, aware that many see all this as strongly as we do ourselves; but it is to those who have not yet found out all the pleasure and the profits of such a course, I venture to suggest it. The study is in many ways its own great reward.

* Part of a Lecture delivered by F. Edward Hulme, F.L.S., F.S.A., before the Society of Art.

The Manufacture of Clouded, Flaked, and Spotted Yarns.

The production of clouded, flaked, and spotted yarns is, according to a specification of an invention just issued, accomplished by placing variously coloured fibres on the swift of a carding engine previous to being formed into a thread by the "rubbers." For the purpose a condenser bobbin is employed bearing condenser threads that are drawn off by feed rollers through guide eyes or raddlers and conveyed to the swift. On the swift is placed an additional roller or stripper, furnished with card teeth at intervals apart, so that as the stripper revolves it tears or pulls a piece off each condenser thread and deposits them on the swift piece by piece, and they are then carried around by the swift, and blended or mixed with any fibre of a different colour, all of which are carried through the machine and finally rubbed into one thread, producing clouded, flaked, or spotted yarn. In order to ensure the condenser threads breaking off, a knife or bar is employed for the stripper to strike against. When it is required to produce clouded yarn composed of three colours, an additional condenser thread and stripper are employed, the cards thereon being so arranged that they place the fibre on the swift in consecutive order one colour after another. If the spots on the yarn are required to be placed nearer to or further from each other, the stripper is caused to revolve quicker or slower, and so deposits the fibre on the swift as required.

SILK.

(*Continued from page* 93).

Heligobalus, according to Lampridin's, was the first emperor who wore silk unmixed with woollen or linen for clothing. His example was then followed by many of the wealthier citizens, but Aurelian (270-275 B C.) neither wore silk himself nor gave it to be worn by others, for when his wife begged to be permitted to have a mantle of purple silk—he answered—"Far be it from us to allow thread to be reckoned to be worth its weight in gold." We also learn the value of this material from a clause in the Rhodian maritime laws published 553 A.D., according to which we find that unmixed silk goods, if they were saved free from wet, were to pay a salvage of 10 per cent. as being equal in value to gold. But in spite of all prohibitions and the exhorbitant price, so great was the demand for silken fabrics and so remunerative was the art of weaving them that, according to the revised code of the Roman laws 533 A.D., a monopoly in it was given to the Roman court, and looms were set up in the palace for its manufacture. Still all the raw material had to be imported and the emperor Justinian, failing in his attempt to wrest part of the trade from the Persians, decided that if possible silkworms should be reared in his own dominions. He succeeded therefore in obtaining from two Persian monks the whole secret of the rearing of silkworms and the manufacture of the fibre; he then induced them to return to China, where they secreted in a bamboo cane the eggs of the worm and returning, brought them in safety to Constantinople 552 A.D., where they were hatched at the proper season, carefully reared in mulberry leaves and thus was introduced into Europe the silkworm, which has been a source of great wealth to European nations. So great was the progress made by the Western world in this art that when in the following reign, an embassy was despatched from China in the hope of opening a trade with Rome, they found the barbarians neither required silks nor instruction in the manufacture of them. This fact was owing probably to the measures adopted by Justinian in reference to it. He took the whole trade into his own hands—the management of it was conducted by his treasurer, weavers were forced into his employ and the prices at which it was to be sold were fixed by him. Exhorbitant as had been the price of the fabric before the introduction of the worm, it was eight times more exhorbitant now. This state of affairs could not last long, for the knowledge that the worm could live and prove remunerative in Europe as well as in its native home caused many to turn their attention to the rearing of it in many parts of Greece especially in the Peloponesus and also in Asia Minor. Greece was the European home of the silk manufacture for 600 years, until Roger I. King of Sicily (into which island the art had been carried from Asia Minor) carried captives from Athens a number of artificers in silk and settled them in Palermo, thus introducing the culture of silk into his kingdom from which it spread to other parts of Italy. Such was the success of the Sicilians in the culture and weaving of silk that the envy of the Venetians, who had for some time had a monopoly in the trade, through their Eastern commerce, was excited and on this account war broke out between the two countries 1148 A.D. But in spite of that the manufacture still flourished in Palermo and drove Greek goods out of the market. It, along with other Italian states, gained great benefit and much wealth from the crusades. Italy made so much progress in this art, that by the middle of the twelfth century the abbot of St. Evroul (Normandy) brought home from South Italy several pieces of rich silk and gave some of them to his church—they were made into copes for the choristers. As there was a feeling in these times in all Christian countries, that the best of everything should be devoted to the church, ecclesiastical garments were generally made of silk and from remnants of these robes we are able to learn what splendid fabrics were woven in the middle ages and how elegant were the designs. In the fourteenth century silk had become so common that a thousand citizens of Genoa appeared in one procession clothed in silken robes. From Italy the art was introduced into Tours (France) by Louis XI., 1480 A.D. and in 1520 A.D by Francis I. into Lyons. It was introduced into Spain by the Moors. Silk was woven in England in the reign of Henry VI. 1422-1461 A.D.; but the greatest impetus to its manufacture was given by the revocation of the edict of Nantes by Louis XIV. 1485 A.D., by which about 50,000 of the best French artificers in silk were driven from their own country and sought refuge in England, establishing their manufacture principally in Spitalfields.

The Art of Weaving in Ancient Times.

Herodotus states that weaving in Egypt was the occupation of men only, not of women, and declares that the wool was always worked upwards by the Egyptians, and not downwards as by other nations; but the native monuments show that both men nnd women were alike employed in both spinning and weaving and that the wool was worked indifferently either up or down. The Egyptian loom was of the most primitive description, the shuttle being passed across by the hand, and not thrown, and all the needful movements being effected entirely by the weaver himself, who, if a man ordinarily sat in the front of his frame. It is wonderful what exquisite fabrics were produced by these simple means. The Egyptians worked in linen, in cotton, and in wool, producing good results in every case, but their favourite textile manufacture was that of linen, and it is in this branch that these fabrics are most remarkable. The fineness of some equals that of the best Indian muslin, while of others it is said that "in touch they are comparable to silk, and in the texture to our finest cambric." Originally the linen was extremely white; but sometimes it was dyed red, and at other times the edges were coloured with indigo, either in a single line or in several stripes. Patterns were occasionally inwrought during the weaving, while sometimes they were superadded by a process analogous to that which in the modern times is called printing. Gold threads were also in some cases introduced to give additional richness to the fabric, which was often transparent as lawn, and of silky softness. The poet who bewails the misery of the "little labourer" has a word of lamentation for the weaver likewise. "The weaver," he says, "inside the houses is more wretched than a woman; his knees are at the place of his heart; he has not tasted the air. Should he have done but a little in a day of his weaving, he is dragged as a lily in a pool He gives bread to the porter at the door, that he may be allowed to see the light." Confinement, close rooms, a cramped position, are no doubt evils, but they are common to many handicrafts, and scarcely separable from that of the handloom weavers. So far, then, the Egyptian workman has no special cause for complaint. If he was literally "dragged in a pool" by an angry employer when he had been idle, he may to some extent claim our pity, though an idle man is perhaps the better for a little punishment: but if the poet merely meant that he looked like a dragged lily after a few hours' hardword in so hot a climate, we need not shed many tears over his hard lot. If the workroom was insufficiently lighted, and he had to bribe the porter to keep the door open, we may admit that he had a grievance, but one not altogether intolerable.—*American Textile Manufacturer.*

Book Notice.

BRITISH AND FOREIGN TRADE MARKS.—By G. G. M. HARDINGHAM, C.E., M.E *Stephens and Sons, London.*

This work contains the principal details of the treaties with, and the laws and regulations adopted in various countries for the protection of property in trade marks; it also gives the fullest information in reference to the steps which it is necessary to take to secure such protection. In the preface Mr. Hardingham says "were the public generally aware what a large number of countries afford protection in trade marks, what small expenses are involved in complying with the necessary formalities, what ample provisions are made for enabling proprietors to defend their rights, and what heavy penalties may be inflicted upon those who counterfeit or usurp the trade marks of others, it would probably be the rule for every one engaged in trade to adopt some distinctive emblem, and to acquire the rights and advantages conferred by, and secured under the trade mark laws." We fully endorse the author's words, and recommend our readers to procure and peruse this work for themselves, in order to be able to do what they can in these days of foreign protection and competition, to protect and to secure to themselves the results of their labours. The author is to be congratulated on producing such a comprehensive and instructive manual, which must have entailed a considerable amount of labour and forethought. To manufacturers of textile fabrics, merchants, and all others interested in the trade, especially those who trade abroad, this work will be of great value.

The Silk Trade in Japan.

A TRANSLATION of an article in a Japan native paper in which it is admitted that the combination of the native silk dealers in defence of what were called their "commercial rights" has resulted in disaster to them, is published in the *Japan Mail*. The writer points out that during the time the dispute existed the markets in Europe and America were favourable to sellers, telegraphic orders were constantly being received in Yokohama, foreign merchants really wished to buy, and native dealers would have been equally glad to sell. This state of things existed from the beginning of September, when the dispute began, to the end of November, when a reconciliation was arrived at: and in the meantime the American looms, it is said, were being supplied with Italian and French silk. When the compromise was effected the demand had ceased, and business in the foreign markets had again become dull; consequently transactions in Yokohama continued almost as restricted as during the dispute. In December, matters had not improved. Speculation was then indueed, and the silver dollar fluctuated in an extraordinary manner. Stocks of silk accumulated, and the money market became tight. The stocks of silk amounted to 17,100 bales—10,000 bales more than in September—the accumulation being larger than had ever been known previously. Money being thus locked up, all departments of trade became stagnant. Fortunately, however, the old ealendar being still maintained in the interior and settlement of accounts not being required by the silk producers at the moment, much money was not needed for the producing provinces, and the Yokohama native merchants were able to tide over the critical period at the close of the year by pledging their silk to foreign firms. At the beginning of the current year some of the dealers were forced to sell at low rates, which caused alarm amongst holders in the interior. Taking advantage of this, the foreign merchants beat down the price to what figure they pleased, and the value of silk actually fell as rapidly as water running down hill Every holder sustained a loss varying from 50 to 80 yen per bale, and consequently found himself short of sufficient money to repay the advances which had been made against his goods. And those who, in order to make up the defieiency, borrowed from commission merchants, were hampered by interest. Further, the twelfth month of the old calendar having now arrived, business in imports has beeome very dull, a fact which has, as a matter of course, lessened the demand for silver dollars. Consequently silver has depreciated. Thus, worried by the interest on loans, and the fall in the value of silk and silver, the distress of native silk owners is indeseribable. The writer goes on to say that they have in effect begun to accede to any conditions, and the foreign traders have been able to violate all the terms of the reconciliation. They (the foreign traders) do not calculate weight according to the actual weight of the goods, they make arbitrary rejections; they beat down the price considerably; and they do not give insurance note and godown receipts; but there being none to make objection, the old abuses have been fully re-established at the present day. The following table shows the fall of prices for silk in the Yokohama market since the outbreak of the dispute up to February:—

	1881. Aug. 30.	1881. Sept. 22.	1881. Oct. 27.	1881. Nov. 24.	1881. Dec. 24.	1881. Jan. 26.	1881. Feb. 4.
	$	$	$	$	$	$	$
Filatures superior ..	710	720	720	730	730	700	660
,, common ..	680	690	690	680	680	660	610
Uyeda red stamped ..	630	630	630	—	—	600	530
,, best	620	620	620	—	—	570	520
Tomioka Jonare ..	630	620	630	630	630	580	560
Mayebash Jonare ..	580	570	570	580	570	520	500
Hachioji Jonare ..	530	530	530	530	—	470	440
Kakedas superior ..	680	700	700	710	700	600	620
Hamatsuki	560	560	550	550	550	500	480

The quotations given are for the best grades.

Weaving and Dyeing.

In a Lecture—the fifth of the series, being given in aid of the Society for the Protection of Ancient Buildings—Mr. W. Morris, who took for his subject "The Lesser Arts of Life," after referring to architecture generally, made the following remarks on weaving and dyeing: "As to weaving, its interest was limited by the fact that it was mechanical, since the manner of doing it had with some few exceptions, varied little for many hundred years. Though mechanical, it produced very beautiful things, which an artist could not disregard. The craft was not a dull one if the workmen were set to do things which were worth doing. As the designing of woven stuffs fell into degradation in the latter days, the designers looked about for trivial novelties, seeking change for the sake of change, and the seriousness of the work was quite destroyed. Its *raison d'être* was that it gave scope to the application of imagination and beauty to any cloth, thick or thin, close or open, costly or cheap. As to the art of carpet-weaving, historically it belonged to the East; but, whenever the art began among themselves, he feared it might almost be said to end with the seventeenth century. He could not agree with the opinion he had heard expressed that carpets could only be made in the East; but, delightful as they were, however, they were the products of a failing art. As to the Persian floral designs, they were still a few of these in existence. One thing seemed certain: that if they did not set to work making their own carpets, it would not be long before they would find the East failed them; for the last gift of the sense of harmonious colour was speedily dying out in the East before the conquests of European rifles and money-bags. In respect to the art of tapestry-weaving, it must be spoken of in the past tense; but yet it was a noble art once, and when it was at its best it took the place in Northern Europe of the fresco-painting of Italy, some of the very best artists spending the greater part of their time in designing for this art.

"No craft had been so oppressed by the "Philistines" as that of the dyer The public were ignorant as to their real wants, and the oppression of the craft belonged almost wholly to their own days. The ancient Egyptians knew well the niceties of the art. He himself had dyed wool red by the self-same process that the Mosaical dyers used, and from the remotest times the whole art was thoroughly understood in India. About twenty years ago the trade was revolutionised owing to the introduction of colours which were the product of coal-tar, they being brighter and stronger than the old dyes, much cheaper in price, and infinitely easier to use; but every one of these colours was hideous in itself, whereas all the old dyes were in themselves beautiful colours. In the circumstances the new dyes must be considered as possessing a negative virtue: they were as fugitive as the older ones were stable. Unless all art was to disappear from their woven stuffs, they must turn round and simply reject the new dyes, which must be relegated to a museum of scientific curiosities. The art of dyeing naturally led him to the art of printing on cloth, which was really a very ancient art, since it was not essential that the pattern should be printed. It had suffered grievously from the degradations of dyeing. If they were not to have any beauty in cloth-printing at all, why should they trouble to have a pattern of any sort on their cotton cloths?"

The Free Traders have called a meeting in advocacy of Free Trade at New York, Mr. Abram Hewitt, member of Congress, heading the call. A strong Free Trade League has been formed in New York, the design being to establish branches throughout the country, with the intention of making Free Trade the leading issue at the next Presidential election.

In the town of Zimatlan, several leagues south of Oaxaca, N M., is the advanced post of cochineal cultivation. It is an Indian village, where little huts of mud and canes are inclosed by palisades of other canes and living hedges of cacti, a species of organo, or organ cactus, that grows straight up in fluted, hexagonal columns. Within these hedges are the gardens of cochineal cactus, which is a species of nopal or prickly pear, growing in rows to a height of three feet, near together, and very carefully tended. Since the discovery of aniline dyes, cochineal has steadily fallen away in value, until now it hardly pays even the Indian to raise it Though worth now but 10 dols. the arroba—twenty-five pounds—it has been lower, but formerly brought as high as 100 dols. the arroba, and immense fortunes were made in it. The Indians affirm that Oaxaca was the original home of the cochineal, whence it was taken to Guatemala and the Canaries. It was formerly the leading culture, but now sugarcane holds that honour, though from various causes hardly enough is produced for home consumption.

Ornamental Fabric applicable to the Manfacture of Skirts, Mantles, &c.

Provisional protection has recently been obtained by Mr. James Francis Wanner, for "An Improved Ornamental Fabric applicable to the manufacture of skirts, mantles, coverlets, cushions, and other articles of dress and upholstery." The object of this invention is to produce an ornamental fabric having the like embroidery stitch pattern on its opposite sides, and capable of being made up or used with either side outwards or uppermost. To this end are taken two lengths of say differently coloured silk or satin, and secured in the frame of what is known as a Swiss embroidery machine, interposing between them a sheet of wadding. The fabrics are stitched at their opposite ends to the canvas of the embroidery frame, and drawn to tension therein. Then by the ordinary embroidery mechanism the three several pieces are sewn together, and into the composite fabric are worked flowers, scrolls, or other patterns. So arranged as to cover equally the surface of the fabrics. The pattern should be so disposed as to leave no large blank spaces, as otherwise the proper uniting of the fabrics in a manner that would admit of the compound fabric being cut up for use in the manufacture of garments would not be attained. Supposing this compound fabric to be used for the manufacture of mantles no lining will be required, as the fabric will be sufficiently warm, and the parts which are turned over, the lappets and cuffs for example, will present a surface equally ornamented to the other parts, and either of the same or of a different colour. Again, when the fabric is used as a loose cover or sack for cushions either face may be indifferently turned outermost and changed as fancy may dictate. The like remark applies when the compound fabric, having faces of different colour, is used for making embroidered petticoats, the same being turned to suit the colour of the dress with which it is to be worn. By thus combining silk or satin fabrics flowers and other devices can be produced which have the effect of being embossed, and that at a cost which will fall far short of that of ordinary hand embroidery.

English Laces.

Her Majesty, if we may judge from the recent royal wedding, has not cast in her lot with the enthusiasts who, with listless efforts are striving to give fictitious support to the English silk manufacturer. At the same time she has not ceased to identify herself with a local industry well deserving favour—the Devonshire lace manufacture. At her own marriage, the Queen wore a dress and veil of Honiton lace, made for the occasion at Beer, a small fishing village. The robe cost a thousand pounds, and the workers during their labours all wore large white aprons and mob caps. For the Princess Royal's wedding a veil of Honiton was specially made in a fine design incorporating the three national emblems—rose, shamrock, and thistle—in medallions, with sprays of their leaves scattered between. The bodice and skirt of the white moire dress were likewise lavishly trimmed with Honiton of similar design. The bridal laces of the other married Princesses—Alice, Helena, and Louise—were also of English Honiton, as were those of the Princess Alexandra. The only exceptions to the rule were when the Duke of Edinburgh married the Princess Marie, of Russia, when a more seasonable trimming of emine was chosen, and when the Duke of Connaught married, three years ago, the Princess Louise of Prussia, when the bride's veil, dress-flounces and fan were of Alençon point. The pattern chosen has almost invariably been like to that worn by the Princess Royal, but the bridal dress of the Princess Alice showed a trellis-work in lace of roses and myrtle, the latter a favourite flower with Her Majesty, as well as an emblem of marriage. Natural flowers of the same kinds were used as trimming and ornaments. A melancholy interest centred in this dress, in that the lace had been chosen for the occasion for the occasion by the Prince Consort prior to his decease.—*Warehouse and Draper's Journal.*

Indian versus European Goods.

Baboo Prionath Palit, a native writer in the *Indian Mirror*, declares that were it not for European patronage, many of the arts in which India excels would die out. The native gentry will not look at anything but European productions; the fine muslins of Dacca, the brass-ware of Benares, the dainty embroidery of Madras, the jewellery of Delhi, or the brilliant shawls of Loodianah and Umritsur, the Indian plutocrat sets down as unworthy of notice. The same disparagement of Indian Goods extends to the English community out there. They buy such commodities, it is true, but chiefly as presents to send or bring home. "Nigger things" is the comtemptuous epithet frequently applied to native works of art, and any one who has the courage to wear such articles is regarded either as eccentric, or—what is worse in India—as to poverty-stricken to afford the European counterparts. Yet the very trinkets or materials which are thus despised come to be held in high esteem the moment the owners reach England.

Protection in Austria.

A protectionist organ in Austria, writing with regard to the prohibitive tariffs of that country, points out with commendable accuracy that thus far at least protectionism in Austria has not been an unlimited success in the combined monarchy. It says that the heavy duties on semi-manufactured goods, indispensable to Austrian industry, have done more injury to the latter than the duties on manufactured goods have done good. In proof of this contention it adduces the figures of the increase of duties on semi-manufactured goods, and we briefly quote those relating to textiles: Raw cotton yarns, No. 50 English, were in 1878 raised to 16fl. from 12fl.; bleached and coloured yarns, No. 50 English, from 16fl. to 20fl.; double yarns, from 20fl. to 24fl.; flax and hemp yarn, which was free, raised to 1fl. 50kr.; linen twist, from 12fl. to 20fl.; woollen yarns, from 5fl. to 9fl.; silk yarn, from 5fl. to 12fl.; silk twist, free until 1878, to 50fl.

The Zurich silk market continues very quite; spring goods, like Louisines and checked Surahs (black, white, and coloured), are in good demand, and France especially is buying eagerly. In black stuffs, such as taffetas, &c., no alteration in the demand can be reported, the market remaining quiet, which is also the case with black satins. Black marcelins are scarcely to be bought now, and manufacturers require longer periods for the fulfilment of contracts entrusted to them.

SCIENTIFIC AND ART NOTES.

The Edison Company is vigorously at work in New York, on its gigantic undertaking of an underground system and central stations for distributing electricity, by which Mr. Edison expects in the end to abolish the use of gas.

* * * *

The following is said to be a good ink for use with rubber stamps:—Aniline violet 90 grains, boiling rainwater 1 oz., to which is added a little glycerine, and a small quantity of treacle. The quantities of the last two ingredients will vary with the season, but half a teaspoonful will be ample for the quantities of violet and water specified.

* * * *

Sir Henry Cole, late Director of the South Kensington Museum and Inspector-General of the Science and Art Department, died on the 19th of last month at his residence in Philbrick Gardens, at the age of 74. For his services in connection with the various British, Foreign, and Colonial Exhibitions, and the Science and Art Department of South Kensington Museum, he was created a C.B. in 1851, and a K.C.B. in 1875.

* * * *

The directors of the railway from Berlin to Antwerp are about to try paper carriage wheels. These wheels are more costly than those usually used, but are said to be much more durable. A hoop will be fixed on to the wheel of compressed paper to consolidate it, and the lateral surface will be covered with thin iron plates to protect them from the influence of the atmosphere. One of the advantages of these wheels is that they will not make so much noise, and will partly do away with the vibrations caused by iron wheels.

ORIGINAL DESIGNS.

Mr. William Tait, 34, Carter Street, Greenheys, Manchester, furnishes us with our first plate, which is a double-page design of an elegant description, intended for a Toilet Quilt of a fine quality, say a 40 or 48 reed. The centre portion is intended to be worked on a small diamond ground, the band dividing the centre from the outer border on a satin ground, and the outer border on a seedwork ground. It will be at once seen from the design here figured that Mr. Tait is an experienced designer of this class of fabrics.

* * * *

Our second plate represents a suggestion for a Linen Damask Table Cover. Mr. Ezra Hoyle, of Bradford, many of whose works have already appeared in this Journal, is the contributor of this design.

* * * *

*** We beg to inform manufacturers and others that adaptations of designs, published in the "Journal of Fabrics," can be made at the Office by experienced Designers, and that Original Designs can also be furnished at moderate charges.

MONTHLY TRADE REPORTS.

Wool.—The trade on the whole is still in an unsatisfactory condition. In Bradford, during the early part of the month, business was of a very stagnant nature, with a consequent weakening in prices. However, towards the latter portion of the month a better disposition to buy on the part of the spinners was manifested; prices, however, did not rise more than a mere fraction, although the month closed with some tendencies to increased firmness in the market. In Leeds and Huddersfield a fair business was experienced during the first few days of April, but the demand fell off subsequently, buyers preferring to await the result of the London sales before making more purchases. In Glasgow and other places in Scotland, business seems to have revived during the past few weeks, and prices tend to the improving side. In the yarn and piece trade some slight improvement has taken place both for home and foreign account for the better class of goods, but prices are yet unremunerative.

Cotton.—In the raw material a fair demand was experienced early in the month, but without any advance in prices; from the middle to the latter part the tone of the market has been quiet. In yarns and cloth no improvement has taken place, business having been of a dull nature. Prices are with great difficulty maintained; in some cases a slight reduction has been made. What little demand there is is mostly for home consumption. Perhaps an exception to the above may be in Bolton numbers, which are in fair request at fairly good prices.

Woollen.—Trade in the woollen districts is in a satisfactory condition. In the Huddersfield district the demand has fallen off, but to no great extent. Business is active in Leeds, both for home and foreign consumption. Stocks throughout the district are lighter than for some years past. Numbers of orders have been placed at firm rates. Full time is the rule in all branches of the trade.

Linen.—Business in all branches has been somewhat restricted.

Carpets.—The demand for the season of the year has been good, in fact better than manufacturers have experienced for some years past; this applies particularly to the better description of carpets. Low classes of tapestries have been slow of sale. Full time is the general rule. Manufacturers are sanguine of doing good business during the coming autumn. The June stock-takings are likely to be of a satisfactory nature with a majority of firms.

Lace.—The markets during the past month have been quieter than than those of the preceding one. Bobbin nets have been dull of sale, and the production of the higher qualities has in consequence been curtailed. Lace curtains have been in good request. The same may be said of furniture trimmings. Embroideries have sold freely. Prices have ruled firm.

Uninflammable Tissues.

At a recent meeting the Société d'Encouragement de l'Industrie presented a prize of 1000f. to Mons. Abel Martin, for the processes he has invented to render tissues uninflammable. We give the different preparations below:—

FOR LIGHT TISSUES.

Pure sulphate of ammonia	17 lbs.
Pure carbonate of ammonia	5 ,,
Boracic acid	6 ,,
Pure borax	4 ,,
Starch	4 ,,
Water	220 ,,

When the solution is at a temperature of 30° C. the tissues are dipped in it, then taken out, and dried and ironed, as if they had been starched in the ordinary manner. The liquid costs about one penny a pint.

FOR PRINTED CALICO, THEATRICAL SCENERY, ETC.

Hydrochlorate of ammonia	33 lbs.
Boracic acid	11 ,,
Glue size	110 ,,
Gelatine	2½ ,,
Ordinary water	220 ,,
Limestone	*q. s.*

This mixture is heated to 80° or 90° C., until it has an oily consistence. It is put on to the material with a brush, like a varnish. In the case of scenery the liquid is put on the wrong side of the canvas, care being taken to lay it on the framework and mountings. With about 2¼ lbs., costing twopence, nearly five square yards can be coated.

FOR THICK CLOTHS, CORDS, STRAW, ETC.

Hydrochlorate of ammonia	33 lbs.
Boracic acid	35 ,,
Borax	6 ,,
Water	220 ,,

The combustible materials are dipped into the mixture at a temperature of 100° C. for 15 or 20 minutes. This liquid costs about twopence a pint.

FOR ALL SORTS OF PAPER.

Sulphate of ammonia	17 lbs.
Boracic acid	6 ,,
Borax	4 ,,
Ordinary water	220 ,,

This mixture is heated to 50° C., and costs about one penny per pint. It is stated that M. Martin's processes preserve their efficacy even after the fabrics have been exposed for several months in a high temperature, in dry or humid air. Some white and colored tarlatans, cotton checks, cloths, printed paper, and a cradle were placed in a stove at 35° to 37° C., and left there for eight months, and remained uninflammable, the colors not changing. The foot coverlet of the cradle, the curtains, etc., were also uninflamable. The wood was carbonised superficially, but would not burn.

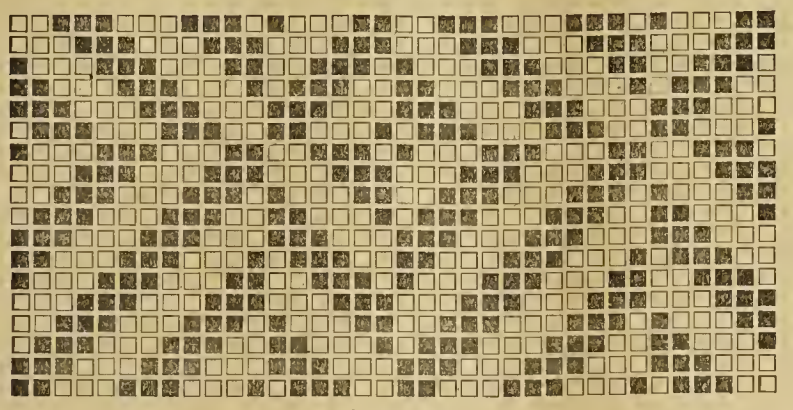
A great number of petitions are being signed in the south and south-west of France, to ask the Government to adopt the project of a maritime canal joining the ocean with the Mediterranean Sea.

M. Decaux has studied the resistance of colours fixed on tissues to alteration under the influence of the electric light, and he finds that its influence on colours fixed in wool by dyeing process is similar to that of daylight. In his experiments the colours were exposed for 1,500 hours to an arc light of 200 candle-power at a distance of a half metre under thin glass. The effect was about four times weaker than sunlight.

DESIGNED BY EZRA HOYLE.

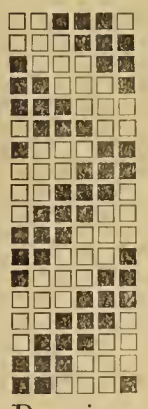
ORIGINAL COATING DESIGNS.

No. 1.



Design.

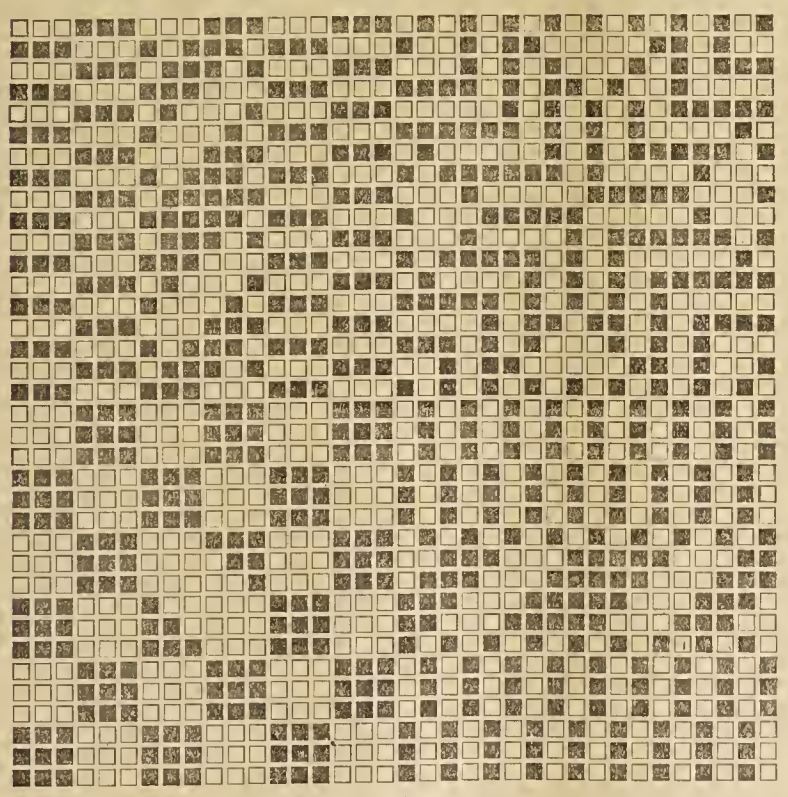
Draft.



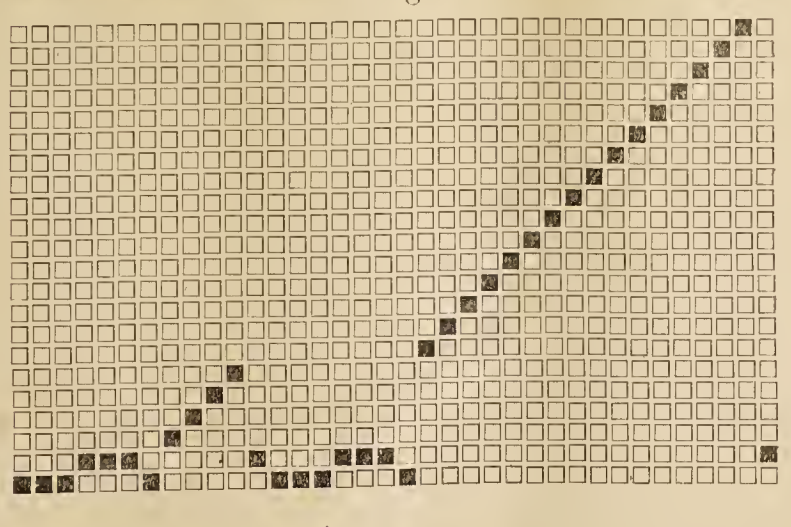
Pegging Plan.

Pattern No. 1 will make a very neat Check for a WORSTED COATING. It is an 18-end Pattern drafted to weave with 6 shafts.

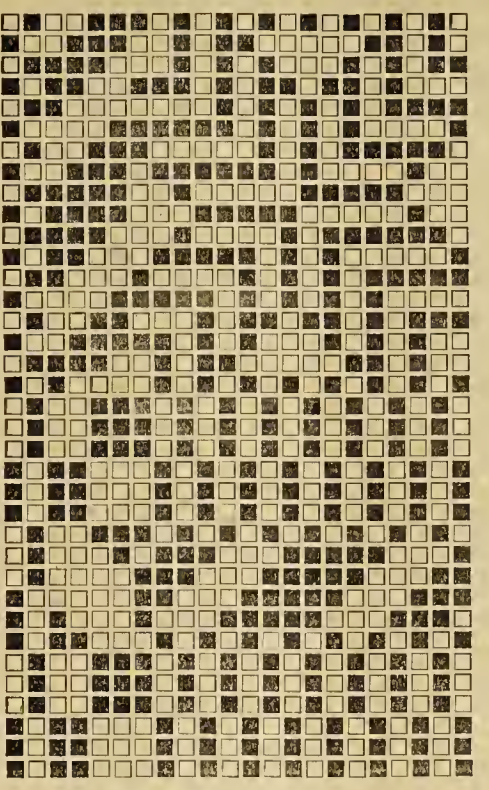
No. 2.



Design.



Draft.

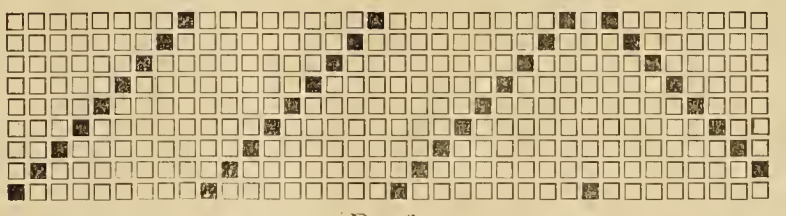


Pegging Plan.

Pattern No. 2 is also a Check for a WORSTED COATING, and is a 36-end pattern, drafted to weave with 22 shafts.

No. 3.

Design.



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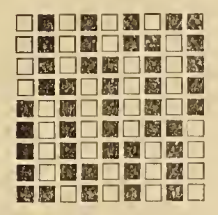


Pegging Plan.

Pattern No. 3 is for a WORSTED COATING, which will make an effective stripe. It is a 36-end pattern, drafted to weave with 9 shafts.

Society of Arts' Patent Bill.

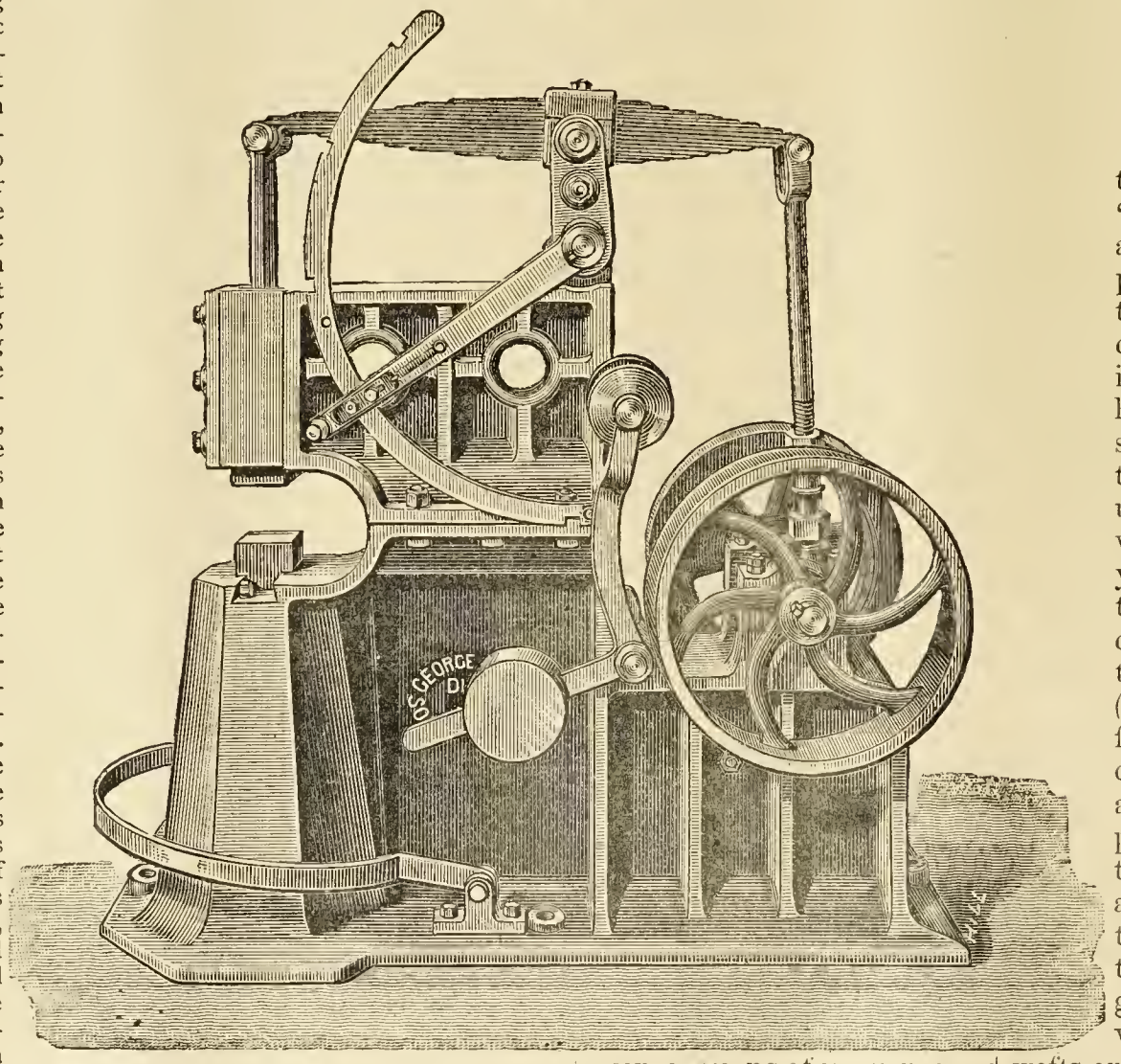
The Society of Arts' Patent Bill was read a second time in the House of Commons on the 28th ult. Sir John Lubbock who moved the second reading, said that the Bill had been very carefully prepared by the Society of Arts, and on their behalf, and in their name, he asked the House to assent to the second reading. The Bill was of a comprehensive character, and dealt with the whole subject of patents. It was understood that the Government had prepared a Bill which he believed would be referred to a select committee, and if the House assented to the second reading, he would then defer further action in order to move that this Bill should also be referred to the same committee. The President of the Board of Trade had been so good as to intimate to him that the Government would assent to this course. The Bill is we understand, set down for committee on Monday the 22nd inst. In our last issue we gave particulars of the principal alterations that will be effected by this Bill.

The great success of the calico ball held at Manchester last January, led to the suggestion of something being done during the summer for the same objects. Arrangements are being made to hold a large garden party at the Botanical Gardens on the 24th June, and a committee has been formed to carry out the arrangements. The garden party is being promoted, like the ball, by the leading calico printers, and the committee expect to issue their prospectus in a few days, with a list of patrons and other information.

MACHINERY, TOOLS, ETC.

Dunham's Patent "Spring Beam" Forging Hammer.

The attention of our readers was called a few months ago to Dunham's Patent "Spring Beam" Forging Hammer, being made by Messrs. George Booth and Co., engineers and machinists' tool makers, Halifax. Recently a very advantageous improvement has been made in the hammers. To describe this improvement it will be necessary to give first our original description of the working of the hammers, which, from the illustration, consists of a "spring beam," connected at one end by a rod with a crank, and at the other with the "tup." The beam works on a pivot a little out of the centre, the shortest arm being the one nearest the crank. By the use of the spring beam a blow of an elastic character, and such as is required to produce the most highly finished work, is given by the long arm. By this arrangement the spring is not so liable to break as in other power spring hammers. The weight of the blow can be altered at will instantly from the heaviest blow to the lightest touch, by the operator placing his foot on a lever, and varying the pressure as required. The additional improvement consists of a lever worked by hand, which on being moved by the operator, raises or lowers as required the pivot on which the spring works whilst the hammer is in motion, so that light or heavy blows can be given without interfering in the least degree with the regularity of the speed. The improvement will greatly facilitate the forging of work, especially that of a varied character. Very little more than half the power is requisite to drive the hammer at "speed" that is generally required for others now in use, as a great part of the force of the impact blow is conserved in the spring beam, to which the hammer head is attached. There is a total absence of "shocks" to the machine, the spring beam taking up the rebound as soon as the blow is delivered. The hammers are capable of doing all classes of forging work, from the lightest jewellers' to the dressing of a 6-inch shaft. They are self contained, and require very little foundation. The anvil and tup can be changed to suit all classes of work, and when a repetition of work is required to be done, no other class of hammer can supercede the one above mentioned. In addition to being manufacturers of the Patent Beam Hammer, Messrs. Booth and Co. are makers of tools, including lathes of various descriptions, planing, drilling, boring, shaping, slotting, and other machines of a high-class character.



An Improved Loom for Weaving Dhootas, Shawls, &c.

The manufacture of fabrics having for their central portions grey, plain, or figured cloth, and for borders, a portion varying in width, of coloured warps, and also of coloured wefts, has for the most part been carried on in India by native workmen, who have done the work by primitive methods. These fabrics, known as "Dhootas," have lately been woven on an improved power loom. To accomplish this, the warp threads are actuated by means of a jacquard, dobby, or tappet motion in such a manner that a shed is formed for the passing of the ordinary shuttle through the central portions of the yarn alternately with sheds formed in the borders for the passing of special shuttles through them, which special shuttles can carry yarn of cotton, wool, silk, or any other fibre of any colour. To enable this to be done, a shed is opened, or the yarn of the warps is divided in the usual manner, excepting the warp yarns forming the border, which latter are allowed to lie on the slay board or shuttle race. The ordinary shuttle is then thrown through this shed so formed, and at the next motion of the loom the warp yarns forming the body or central portions of the fabric are in turn allowed to lie on the shuttle race or slay board, and the border sheds are opened for the passage of the special shuttles that are actuated in the following manner, viz:—A shuttle race, guide, or carrier is formed for each special shuttle, and is constructed in circular form and fitted with a shuttle, which is formed with the required curve to enable it to fit or slide in the circular race or guide. Portions of the circle of the race or guide are cut away to enable the open shed to be made with the warp yarns for the passage of the curved shuttle, and for taking it in and out. The circular race guide or carrier is mounted on a slide, or on a lever, whereby the shuttle guide is caused by suitable mechanism to follow the reed or battern in its to and fro motion, but independently of the battern at those times when the shuttle contained therein is required to be passed or thrown through the warp threads. Motion is given to the shuttle by means of a rack and pinion, or of spring pegs actuated in any manner by means of the ordinary working parts of the loom. The invention is applicable to the weaving of shawls, handkerchiefs, fringes, or fringed fabrics.

Figured Cloth.

An invention relating to the kind of cloth called "Mitchel-line" was patented a short time ago. The patentees, who designate their cloth "Improved Mitchel-line," in carrying out its manufacture employ a loom of the ordinary construction, and make use of two yarn beams, and also use fine weft and coarse weft from two shuttles; the yarn from one beam is used to form the plain cloth which constitutes the figure, and the yarn from the other (termed stitching yarn) to form the plain ground which defines the figure. Twice as many separate ends are placed on the latter as on the former, and these ends are divided in the tabby, thus enabling the making of two picks of coarse weft together, and two picks of fine weft together. The progressive motions of the yarns and wefts are as follows: The face yarn is to be formed tabby, that is, one end up and one end down, and at the same time the stitching yarn is raised to define the figure; this position of the yarns forms the threads through which the shuttle runs, the first pick being coarse weft; to make the second shed, the face yarn is changed to the other tabby, and the stitching yarn again defines the figure, this second pick being also coarse weft; to make the third shed, the stitching yarn only is changed to the tabby, this third pick being fine weft; to make the fourth shed, both the face yarn and the stitching yarn are to be changed to the reverse tabby of the previous pick, this fourth pick being fine weft; this completes the round, and these operations being continued produce the cloth. It will be seen that the stitching yarn works as follows: The first pick of weft, figure; the second pick, figure; the third pick, tabby; the fourth pick, reverse tabby. The face yarn works thus: The first pick, tabby; the second pick, the reverse tabby; the third pick, the same as the second; and the fourth pick, the same as the first. By the use of this invention the cloth can be woven at a lower cost than by the old method, as a drop box is required at one side of the loom only, and there are double the usual number of separate ends of stitching yarn divided as described above. An improved cloth is also woven, the ground of which is finer, and if coloured, is much more effective than cloth woven by the old method.

Bleaching Jute.

It was an important question, for a long time, which method should be employed for bleaching this fibre without injuring it. Paper manufacturers have been especially interested in this regard, as it became very important to them to obtain a product which might be white enough to be mixed with other kinds of goods in order to produce a paper which is, in some regards, superior to that which is prepared only by cotton and woollen fibre. Many methods have been recommended, but most of these, perhaps all of them, produce only a yellowish white product, but not a clear white, which is obtained with cotton by the chlorine bleaching process. Jute, being very sensitive against alkalis and acid, which injure the fibre, even if they are in the diluted state, and by boiling destroy the fibre entirely, has to be treated by a bleaching agent which is as near as possible neutral. Bleaching powder is generally pretty nearly neutral, and can be used for this purpose, whereby care has to be taken that the fibre be entirely covered by the solution. By this treatment jute is bleached pretty well, but has not received the clear white appearance which is wished. It is, therefore, necessary to subject it to further treatment. Chloride of calcium which has lately, besides chloride of magnesium, been recommended for bleaching purposes, serves very well for jute also, but it seems necessary to have a soap bath in connection with the chloride of calcium bath. After the fibre has been treated with bleaching powder solution, it is washed in a weak soap bath, and then entered the chloride of calcium. These two last treatments should be repeated several times.

For obtaining a light cream shade the *Revue des Matires Textiles* recommends the following treatment:—

1. The jute is treated for ten minutes in a weak, lukewarm soap bath, then taken out and drained.

2. The jute is entered a solution of chlorides of calcium of ½° and left in the bath for forty minutes.

By the above method, a clear creamy shade is obtained, which, however, can be changed to a purer white by allowing the fibre to stay in the baths for a shorter time only and repeating the operation several times. The goods are then washed first with lukewarm and afterwards with cold water, which is very important for the shade as well as for the fibre itself. The goods are then drained and dried at a low temperature. Whilst the jute is immersed in the various solutions, it is advisable to keep it moving constantly, and care should be taken that it does not come above the surface. The contact with the atmospheric air would cause a more rapid bleaching, but the goods never would be as even as if treated in the solution itself. —*Textile Colorist.*

The Union Nationale of Paris and the French Treaty.

The secretary of the London Chamber of Commerce has received notice that the Union Nationale of Paris, representing 96 Syndical Chambers, has, on consideration of the circular of the 13th of March last from the London Chamber, unanimously adopted the following resolution :—

"Considering that England is the most important market for French products, and particularly for the manufactures of Parisian industry represented by the Syndical Chambers of the Union; that England is at the same time our principal place of supply for the raw materials which we employ; that there is every necessity that the old and active commercial relations established between that country and France, particularly since 1860, should not only be maintained but, if possible further developed; considering that the treatment of the most favoured nation clause spontaneously accorded to our neighbours by the French Government, if it temporarily suspend the danger of the disastrous application of the general tariff, does not possess neither the advantages nor the security of a bilateral convention of fixed duration — this union considers as profoundly regrettable the rupture of the negotiations for the Anglo-French treaty, and expresses the desire that these negotiations be resumed at the earliest possible date, even if the French Government be obliged, in order to attain this result, to make some concessions with regard to the absolute application of specific duties, particularly as to those which bear upon cotton and woollen textiles. It was further resolved that this resolution be communicated to the Minister of Commerce and the Paris Chamber of Commerce."

A special meeting was also fixed in order to determine what steps of public agitation be taken with reference to the treaty. This decision of 96 Chambers considerably outweighs that of the 40 Protectional Chambers a fortnight ago, without even considering the energetic protests of Lyons, Bordeaux, St. Etienne, and other centres. The Paris Chamber of Commerce has named a committee to wait upon the Government and find what its dispositions are as to the renewal of the negotiations, and to indicate the importance of a treaty with the British nation.

The Oxidization of Colouring Matters applied to Pile Fabrics.

Manufacturers and others interested in velvets, velveteens, and similar pile fabrics, should greatly benefit by a process which has been patented for the oxidization and deodorization of the above materials in a few hours, instead of requiring, as by the ordinary process, some days to effect. The process consists of submitting the fabric to the action of strong currents of air—heated or cold—and moistened, if requisite, after the colouring matters have been applied to the fabrics in the usual manner, thereby obviating the necessity of hanging the velvet, &c., and allowing it to remain for a long time in a large stove or drying room heated by means of steam pipes, or other radiators, as hitherto has been the practise. The process is carried out as follows :—

An oblong chamber is used, made of wood, brick, or other material, fitted with an apparatus of the kind ordinarily used with drying stoves to carry the fabrics in loops or folds continuously from one end of the chamber to the other. The fabric is delivered into the chamber by rollers, which are covered with card fillet to avoid injury to the pile. A fan is employed to force upwards from the bottom of the chamber a continuous and very powerful current of fresh air, the air being heated, if necessary, by passing it through pipes surrounded by steam, or by any other radiators of heat. If desirable, the air may be moistened by steam before it enters the chamber, or steam may be admitted into the chamber. The pile side of the fabric forms the outside of the folds, so that the air may act on the surface of the pile where the colour is applied in order to oxidize and deodorize it. The air is allowed to escape by outlets at the upper part of the chamber. The fabric is afterwards carried through and taken from the chamber by any carrying apparatus, and is drawn from the chamber by rollers which are covered with card fillet, so as to protect the pile from injury, after which it is plaited down or otherwise disposed of, having been passed continuously through the chamber in loose folds without injury to the pile by squeezing. The fabric may remain stationary while it is submitted to the action of the air.

Mohair Culture in the United States.

There are millions of acres of land in the United States, now useless, that could be successfully and profitably employed. They lie among the middle and southern ranges of the Appalachian chain, to say nothing of like areas in our Western territories, and could be had on nominal terms. If occupied, the gain to the nation, in many ways, would be very great. When the public weal, as well as private gains, can be advanced by the successful pursuit of an industry, however the pursuit may be environed by difficulties, there is not wanting mind, money, and energy to solve the problem. The most valuable known lanigerous animal is the pure bred Angora goat, whose fleece for the past twenty-seven years averaged twice the price for the best combing wools in the Liverpool market. In their native haunts in Central Asia Minor, their habitat is high, dry, and with substance largely composed of wild grass, briars, scrub-oak leaves, &c. The usual product of the varieties best known there, in fleece, is five or six pounds of mohair to the animal per annum, and the cost of maintainance not over 25 cents per year. The whole number of these animals in Asia is probably highly estimated at five millions. As to the benefit that would follow the successful introduction of this husbandry, we need but refer to two industries which year by year are rapidly assuming large proportions, each of which would be immensely benefited by a large growth of native mohair. We refer to the silk and worsted industries. The first being to day in France and the other in England among their leading profitable manufactures. The value of mohair in the worsted industries of Bradford, Saltaire, &c., of England, is quite generally known and properly estimated. What mohair can do in aid of the silk industries of the globe has long been known to the artisans of India, China, Persia and a few keen but reticent men on the Continent and in England, who are making the fleece of the Angora supply the place of the

silkworm's product, at four times the price of first cost; while the product in the fabric of mingled silk and mohair is not only not of less value than of wholly silk, but is, for the purposes intended, increasing in all desirable qualities. It needs no arithmetic to figure out the advantages coming to all interests from the products on a large scale of such a raw material. To whoever should inaugurate, on a new and liberal scale, this industry with integrity and intelligence in the selection of breeds and locations for the same, will surely reap pecuniary profit, and the satisfaction of knowing he has greatly advanced many and varied interests, ultimately connected with the prosperity of all classes of the community.—*United States Economist.*

ODDS AND ENDS.

It is said that all the experiments in growing cotton in California have been favourable, and it is believed there that cotton will soon be a regular product.

* * * *

A conference will shortly be held between representatives of Japan and the various European States to decide upon a common basis for the revision of the Commercial Treaties by which they are at present bound.

* * * *

It is rumoured that the French Post Office intends to buy up the patent rights of the telephone in France. It is proposed to open stations in connection with the existing telegraph offices, at which the public, without becoming subscribers, may communicate with subscribers at a charge of half-a-franc for every five minutes' conversation, as has been done in Germany and Switzerland.

* * * *

The New York trade returns for nine months ending with March show imports, 350,838.950 dols.; exports, 266.309,543 dols. As compared with the returns for the same period in the previous year they show 34.000,000 dols. increased imports and 48,000,000 dols. decreased exports. The New York *Journal of Commerce* thinks that the trade of the entire country now exhibits a balance against it, the imports being so large.

* * * *

The opening of the textile exchange in Berlin has led to the revival of a project at Leipsic for the establishment of a similar market there. The transfer of stocks to the Leipsic fairs, and the time wasted in visiting customers, are all begrudged by manufacturers, and it is hoped that by the establishment of a textile exchange many of the inconveniences attending the present system will be removed.

* * * *

Mr. E. C. Guinness, of Dublin, has determined to reintroduce into Ireland the manufacture of heavy woollen and worsted cloths, and with that object has just erected at King's Bridge, Dublin, an extensive weaving shed. At present it is not intended to undertake spinning, but the establishment will comprise a department for dyeing. A number of girls are already being trained in weaving, and it is expected that before many months are out several looms, both plain and fancy, will be running.

* * * *

The Russian Ministry of Commerce and Manufactures has published statistics of the manufactures of the empire. Not including Siberia, Caucasus, and Turkestan, and not taking into account the metallurgical industries (which have an annual production of about 100 millions of roubles), the number of works in Russia is 35,159, with a production of 1,635,492,000 roubles, and employing permanently 873,246 workpeople. Adding the Asiatic part of the empire and the metallurgical industries, the number of workpeople employed is about 1,000,000, and the production 1,500 million roubles. Twenty years ago Russian industries did not reach half of these figures.

* * * *

At Chemnitz, in Saxony, there are eight technical schools. The staple industries of this town are machine making, cotton and wool spinning, weaving, and hosiery and glove making. The schools are under the superintendence of the Home Minister. They comprise, 1st, the Royal State Technical Educational Institutions (the Higher Technical School; the Royal Builders' School; the Royal Foreman's School; and the Royal Technical School); second, The Higher Weaving School; 3rd, the Hosiery School; 4th, the Agricultural School; 5th, the School for Hand Weavers; 6th, the School for Tailors; 7th, the "Fortbildungs" (Trade) School for Males; and 8th, the "Fortbildungs" School for Women.

* * * *

A report from Valencia says that the incubation of the silk worms in Spain has proceeded without accident, and a far larger quantity of eggs are being hatched than last year. The eggs have been nearly all obtained from France, and confidence in them is general. The quantity is, however, so disproportioned to the supply of leaf which is nevertheless fine and abundant, that in case of complete success with the hatching, it will be necessary to destroy one-half of the worms owing to want of food. The quantity of mulberries pulled up every year in Spain is so great that if the destruction continues at the same rate a few years longer the memory of their existence will alone remain in Spain.

The patent of Palangie and Bedu for rendering rough silk sufficiently white for dyeing in all colors consists in the following process: The silk, after being scoured by the ordinary means, is immerged in a solution of bromine, more or less concentrated, according as the coloring matter is more or less tenacious. The duration of the bath is thirty minutes. After draining, the silk is put into a second bath composed of any acid diluted with water. After half an hour the silk is lifted and drained. It is sometimes necessary to give two or more baths of bromine, followed by as many acidulated. Tartaric acid or citric acid give the best results, but they may be replaced by alkaline solutions, and in this case, carbonate of soda would be indicated. The sulphides and bisulphides and sulphureous acid are equally well adapted for the second bath.

* * * *

The Melbourne correspondent of the *Times*, referring to the Victoria Tariff Commission now conducting its investigations, says: The Protectionist members of the Commission must so far be somewhat disconcerted with the result. Almost all the witnesses express themselves dissatisfied with the existing heavy duties on imports. Their evidence may be summarised in very few words. They say that the duties have attracted so many competitors into the protected interests that Victoria is now glutted with her own manufactures, that she wants a more extended market, that the system of drawbacks on exports is ineffectual against Sydney competition; and hence not a few of the larger manufacturers, whether in leather or iron, declare that they are deriving no good from the present system. If the Commission will only honestly report on the evidence, a great shake will be given to the popular belief in "protection to native industry," as it is called by its advocates.

* * * *

The proposed Floating Commercial Exhibition of British Manufactures is in a fair way to be realised. A steamer of 3 000 tons, bearing the name of the Viceroy, has been chartered, and will be fitted up for the display of samples. The exhibition deck is divided into spaces of 3 ft. by 2 ft. superficial, by about 7 ft. high, for the use of exhibitors, and in June she will start on her journey round the world, visiting India, Australia, New Zealand, South Africa, and many other places, in order that "manufacturers, patentees, and others shall be able to bring samples of their specialities under notice at the chief foreign and colonial markets in an attractive and satisfactory manner." The voyage is to last about a year. The agents are Messrs. Fry and Co., 17, Fenchurch Street, and Messrs. F. Green and Co., 13, Fenchurch Avenue, E.C.

* * * *

The new Russian tariff which is to come into use on the 1st July this year, nearly doubles many of the present duties. Some of the most important increases are as follows:—Cotton yarns, from 3 roubles 25k. to 4 roubles 50k. per poud; the same dyed, from 4 roubles 25k. to 5 roubles; indigo, from 3 roubles to 5 roubles per poud; tools, from 80 kopeks to 1 rouble 50k.; paper, from 6 roubles to 9 roubles; carpets, from 30 kopeks to 75 kopeks per lb.; lace, from 3 roubles to 5 roubles per lb.; linen buttons, from 30 kopeks to 60 kopeks; flowers and feathers, from 6 roubles to 10 roubles per lb.; Linen which used to pay a heavy *ad valorem* duty, will now pay duty per lb., amounting to about 11 per cent higher than formerly. Linen goods will also pay 10 per cent more. Dresses, trimmings, bonnets, &c., will pay from 30 to 50 per cent more than formerly. Goods made of fur will pay the highest duty due for fur at present, and 100 per cent. more besides.

* * * *

A general meeting of the members of the Association of Leeds Cloth Cloth Pressers was held recently, for the purpose of considering a resolution giving the committee power to deal with special cases. The meeting unanimously decided that the committee should have unlimited power to deal with those cases as they arose, on the understanding that after the stock had been worked off, the 50 yards' limit should not be exceeded. By this means the dispute, so far as 14 cases are concerned, was settled. In these cases permission was given to the men to handle lengths which were in stock, the length of which was a few yards above the 50 yards' limit, the firms concerned having giving a guarantee that they will not in future take in or manufacture lengths over 50 yards. As regards "narrows," the committee have placed the limit at 60 yards. It is believed that these concessions will put an end to the dispute in several cases where firms are holding out.

Mercantile Assistants, &c., Wanted.

WANTED, by a London House, a Young Man competent to take charge of the Sample and Pattern Department, and to make himself generally useful: salary £100 per annum to start; unexceptionable references.—M. S., 15, Lincoln Grove, Plymouth Grove, Manchester.

WANTED, a first-class MANAGER, for a Printworks abroad; must be thoroughly competent as a chemist, and in all branches of Calico Printing; liberal salary to a first-class young man.—Apply by letter to Gassier and Baume, Windmill Street, Manchester.

Engines, Machinery, and Tools.

COTTON OPENER, Lap Machine, Finishing Lap Machine, 23 Carding Engines, 3 Drawing Frames, 3 Slubbing Frames, 5 Intermediates, 18 Throstles; 6 Mules, 794 Spindles; 4 Mules, 650 spindles; Winding Frame, 300 spindles, by Walker and Hacking; 2 Warping Mills; 5 Double Reels, 50 Hanks; Twibill's Economiser, 60 pipes; Pumping Engine, Strapping, Bobbins, Roller Ending Machine; Weighing Machines, Chatwood's Safe, Skipps, Cans, and Sundries, on the premises of the Bury and Radcliffe Spinning Company Limited, Radcliffe, where the same may be seen and prices obtained; or on application to Mr. Thomas Parkinson, the liquidator, Moorside Spindle Works, Bury,

Manufactories, Works, &c.

TO BE SOLD, the ALBION MILL, Mossley, containing about 20,000 Spindles, Twist Gauge, Mules, Self-actors, with all preparation, in good working order; Steam Engines, compounded, by Martin and Smithurst; Boilers, nearly new; Green's Water Heater; abundant supply of soft water. —Apply to Mr. J. C. Buckley, Mossley; or Mr. Hallam, Heaviley Mill, Stockport.

Miscellaneous.

TO EXPORTERS.—Mr. Edward Coward, of 2, Pekin Buildings, Liverpool, has considerably extended his Shipping Agency Business, and begs to inform Export Manufacturers in the Woollen Cloth, &c., districts, that he will be happy to conduct the shipment of any goods they send through Liverpool on his usual moderate terms, which may be had on application. Every facility for despatching cargo with rapidity and economy.

THE GAZETTE.

Adjudications of Bankruptcy.

Shackleton William, Springwood Mill, Todmorden, and Vale Manse, Todmorden and Walsden, cotton spinner and manufacturer.

Liquidations by Arrangement or Composition.

Dendy John and John Russell Beard, Faulkner Street, Manchester, and Macclesfield, silk manufacturers.

Holmes William Wainman and Thomas Wainman Holmes, Baildon, and Booth Street, Bradford, worsted spinners and stuff manufacturers.

Pendle George and Charles Waite, jun., Golden Square, and New York, woollen merchants.

Wilkinson John, Earl Street, Shipley, Bradford, yarn salesman.

Beard John Russell, Faulkner Street, Manchester, and Macclesfield, silk manufacturer.

Ford George, trading as George Ford and Co., Well Street and Paradise Street, Stoke Newington, shirt manufacturer.

Roebuck Thomas, Noble Street and Dulwich, mantle manufacturer.

Truman George Brentnall, trading as J. and G. Truman, St. Mary's Gate and Derby Terrace, Nottingham, lace manufacturer.

Brook Samuel, Longwood, Huddersfield, woollen cloth manufacturer.

Sequestrations.

Ewen Robert and Co., Hawick, tweed merchants, and Robert Ewen, sole partner.

Trustees Appointed.

Yates John (Liquidation)Lees, near Manchester, cotton spinner. Trustee, J. C. Atkins, Oldham, accountant.

Driver Rhodes (Liquidation), Morton, Bingley, stuff manufacturer. Trustee, W. Glossop, Bradford, accountant.

Watt George H., trading as Johnston, Watt and Co., Glasgow, cotton yarn merchants. Trustee, J. W. Gould, 65, St. Vincent Street, Glasgow.

Dividends.

Lees Thomas, trading as Thomas Lees and Co. (Liquidation), Liverpool and Litherland, cotton broker. 1st dividend, 1s. 6d.

Churton James, trading as William Churton and Son (Bankrupt), Oxford Street, hosier. 1st dividend, 2s.; J. D. Viney, 99, Cheapside, accountant.

White Joseph (Liquidation), Bradford and Wakefield, worsted spinner. 2nd and final dividend, 7½d.; B. Musgrave, Bradford, accountant.

Horsfall John and Eli Horsfall, trading as Horsfall Bros. (Liquidation), Warley, Halifax, worsted spinners. 1st and final dividend, 5s. 4d.; J. I. Learoyd, Halifax, accountant.

Knight Edwin and John N. Knight (Liquidation), both Burbage, Leicestershire, hosiery manufacturers. 1st and final dividend, 1s. 5d.; E. Roberts, Leicester, accountant.

Dissolution of Partnerships.

Alenson G. T. and Co., Nottingham, lace Manufacturers. Debts by George Thomas Alenson.

Allen J. H. and Co., Norwich, and Watling Street, London, textile manufacturers.

Atherton William and Joseph, Horwich, near Bolton, cotton spinners. Debts by Joseph Atherton.

Berry James and Sons, Oldham and Chaddedton, cotton spinners. Debts by Joseph Berry.

Briggs Bros., Ossett, Dewsbury, cloth manufacturers.

Carus and White, Blackburn, cotton manufacturers.

Clarke Enoch and Sons, Neate Street, Coburg Road, Old Kent Road, table cover manufacturers.

Dixon, Rhodes and Chambers, Great Wilson Street, Leeds, cloth finishers.

Edmondson and Ormerod, Barnoldswick, Yorks, cotton manufacturers. Debts by Edmondson Ormerod.

Green and Wright, New Normanton Mills, Derby, silk throwsters and gimp trimming manufacturers. Debts by Joseph Green.

Robertshaw and Pickles, Heckmondwike, woollen manufacturers. Debts by Sam Robertshaw.

Sackville B. and Sons, Eccles, calico printers.

Schofield and Johnsons, Oldham and Hyde, cotton spinners.

Shaw Richard and Co., Carlisle Street Mill, Blackburn, cotton manufacturers.

Thomas and Bell, Leeds, and Hawksworth Low Mills, near Guiseley, woollen manufacturers. Debts by Benjamin Thomas.

Thompson William and Sons, Habergham Eaves, near Burnley, cotton spinners and manufacturers.

Walters and Thwaite, Halifax, wool staplers.

Ward and Hallam, Millholme near Skipton, and Bradford, manufacturers.

Wallace, Field and Co., Wibsey, worsted manufacturers. As regards John Field.

Bills of Sale.

Reddrop W. J., Westbourn Road, Trowbridge, Wilts, cloth merchant, for £200, to George Mundy.

Chalk Abraham, Albion Mill, Bacup, cotton manufacturer, for £1126, to Ed. N. M. Hepworth.

Duplantier A., Cavendish Road, Kilburn, lace trimming maker, for £38 18s., to L. and W. Loan, &c., Co.

Turner William, Richard Turner, Nathaniel Turner, and another, Blackburn, trading as J. Turner and Sons, cotton manufacturers, for £6,800 mortgage and indem., to James Turner.

Glazebrook C. A., 87, Cawdor Street, Liverpool, cotton salesman, for £40, to E. A. Reynolds.

Laycock Alfred and A. Marsden, Tower Mills, Dalton, Huddersfield, yarn spinners and woollen manufacturers, for £2,000, part purchase money, to H. Flower and another.

PATENTS.

Applications for Letters Patent.

1488 John Hodgkinson and James Hodgkinson, Blackburn, "Improvements in looms for weaving."

1501 Alfred Julias Boult, of the firm of W. P. Thompson and Boult, agents for foreign patent solicitors, 323, High Holborn, London, and 6, Lord Street, Liverpool, "Improvements in apparatus for sizing hand-beamed warps for weaving."—A communication.

1502 John Henry Johnson, 47, Lincoln's Inn Fields, Middlesex, gentleman, "Improvements in methods of and apparatus for sewing and trimming knit goods and other fabric, and in forming welts or hems therein."—A communication.

1503 Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in machinery for opening and cleaning cotton." —A communication.

1520 Joshua Charles Rouse, Halifax, "Improvements in looms for weaving tufted pile fabrics."

1523 Richard Hindle and George Greenwood, Blackburn, "Improvements in looms for weaving."

1538 George Herbert Hodgson, Bradford, machine maker, and James Broadley, Bradford, "Improvements in looms for weaving."

1610 William Cliffe, Ley Moor, Golcar, Huddersfield, machine maker, "Improvements in machinery or apparatus for feeding wool and other fibres to carding machinery."

1611 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in electromagnetic and regulating apparatus, chiefly designed for use in electric lamps."—A communication.

1673 Henry Barratt, Nottingham, overlooker, "Improvements in circular knitting machinery"

1718 Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in drying machines for use in dressing or finishing fabrics."—A communication.

1736 Thomas Blackhurst, Preston, "Improvements in looms for weaving."
1807 Silvester Fulda, Bow, Middlesex, "Improvements in the method and means of preparing fabrics for bleaching and dyeing."
1810 William Holms, Glasgow, "Improvements connected with spindles of doubling and twisting frames."
1829 William McNichol, Batley, loom turner, and James Hollingworth, of the firm of Hutchinson, Hollingworth and Co, Limited, Dobcross, woollen loom makers, "Improvements in looms for weaving."
1860 James Worrall, Ordsall, Salford, dyer, and John Kershaw, Wadsworth, Halifax, manager, "Improvements in apparatus for dyeing piece goods."
1861 William Biever Kirkby, Liversedge, gentleman, "Improvements in picking arms and pickers employed in looms for weaving."
1894 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improved methods of and apparatus for spinning silk and other materials."—A communication."
1904 Charles Denton Abel, 28, Southampton Buildings, Chancery Lane, Middlesex, "Improvements in calendering machines."—A communication.
1921 Samuel Musgrave, Leeds, "An improved 'mordant' to be used in dyeing blues."
1925 John Tuffnell, Manchester, "Improvements in treating and finishing lace fabrics."
1927 Joseph Mugnier, 45, bis, Rue Tronchet, Lyons, France, manufacturer, "A process for applying colours or designs on tissues or other surfaces."
1978 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in the decortication of the stalks of the Chinese nettle, China grass or rhea, and in the cleansing and separation of the fibrous portions thereof, and in machinery or apparatus therefor."—A communication.
1996 Harry Whiteley King and Herbert King, Hebden Bridge, "Improvements in the manufacture and finishing of moleskin cloth."

Grants of Provisional Protection for Six Months.

664 1091 1329 1350 1370 1374 1411 1418
1919 1433 1473 1488 1501 1503 1523 1559

Notices to Proceed.

1066 1227 1262 1265 1370 1419 1433 5174
5282 5292 5301 5423 5443 5496 5678 5678

Patents Sealed.

366 Samuel Cunliffe Lister and José Reixach, Manningham, "Improvements in power-looms for weaving figured pile fabrics."
373 John Rawlinson Richards, Kirkham, Preston, "Improvements in the construction of shuttles used in looms for weaving."
423 Charles Alfred Barlow, of the firm of H. B. Barlow, Manchester, patent agent, "Improvements in the manufacture of machine embroidery."—A communication.
451 Joseph Anthony Dixon, 151, St. Vincent Street, Glasgow, solicitor, "Improvements in the manufacture of colouring matters suitable for dyeing and printing."—A communication.
444 Frederick Albert Gatty, Accrington, dyer and calico printer, "Improvements in dyeing cotton yarns and yarns of other vegetable fibre in the cop."
557 Frederick Albert Gatty, Accrington, dyer and calico printer, "Improvements in dyeing cotton yarns or yarns of other vegetable fibre in cop or on bobbins."
4353 John Tatham, Rochdale, machine maker, "Improvements in machinery or apparatus for preparing wool, cotton, or other fibrous materials."
4399 John Leadbeater and Alfred Leadbeater, Morley, iron and steel merchants, "Improvements in the method of and apparatus for feeding wool and other fibres to scribbling and carding machinery."
4406 Thomas Thorpe, New Basford, Nottingham, manufacturer and machine builder, "Improvements in machinery or apparatus for the manufacture of knitted or looped fabrics."
4432 James Barbour, Belfast, Ireland, machinist, "Improvements in looms for weaving."—A communication.
4457 Thomas Graham Young, Penicuik, North Britain, "Improvements in bleaching jute."
4460 James Lee Norton, 159, Piccadilly, Middlesex, engineer, "Improvements in machinery, apparatus, or means for tentering, stretching, and drying fabrics, and in drying other materials."
4464 William Terry and John Scott, Dudley Hill, Bradford, commission wool combers, "Improvements in machinery or apparatus for combing wool and other fibrous substances."
4465 Joah Lodge, Huddersfield, manufacturer, and Mark Oldroyd, Dewsbury, manufacturer, "Improvements in machinery for stretching and 'winding on' woven fabrics and for removing the creases and ridges therefrom."
4495 William Edward Gedge, 11, Wellington Street, Strand, London, patent agent, "Improvements in looms for weaving."—A communication.
4734 Peter Crook Marsden and William Pendlebury, Bolton, "Improvements in the construction of apparatus employed for combing cotton and other fibrous substances."
4752 Maurice Bauer, civil engineer, of the firm of M. Bauer and Co., solicitors of patents, Paris, "Improvements in apparatus for weaving or braiding hollow articles."—A communication.
4774 Charles Alfred Barlow, of the firm of H. B. Barlow, Manchester, patent agent, "Improvements in shaft machines for looms."—A communication.
4815 William Spowage, Nottingham, "Improvements in carriages employed in bobbin-net or twist lace machines."
4846 Orange McConnell Chamberlain, Gresham House, Faraday Road, Notting Hill, Middlesex, "Improvements in pleating and frilling machines."
4980 Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in embroidering machines."—A communication.
5340 James Baird, Glasgow, manager to Messieurs John Brown and Son, power loom manufacturers, "Improvements in looms for weaving gauze fabrics"
5440 John Christmas Sewell, Eustace Hulton, and John Bethel, Manchester, "Improvements in sectional warping and beaming machines."

Patents on which the Stamp Duty of £50 has been Paid.

1351 Richard Longden Hattersley, Keighley, machine maker, and James Hill, mechanic, "Improvements in looms for weaving."
1378 Tom Mitchell, Bradford, spinner, "Improvements in spinning."
1431 Isaac Holden, of the firm of Isaac Holden and Sons, machine wool combers, Bradford, "Improvements in means or apparatus employed in carding wool and other fibres."
1482 John Tatham, Rochdale, machine maker, "Improvements applicable to machinery for spinning and doubling cotton and other fibrous materials."
1529 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in knitting machinery, chiefly designed for the manufacture of stockings."—A communication.
1532 Roger Tatham, Rochdale, mechanical engineer, "Improvements applicable to machinery for preparing cotton and other fibrous materials for spinning."
1628 Robert Reid, of the Air Burning Company, Limited, Glasgow, North Britain, "Improvements in irons for smoothing, polishing, or burnishwoven fabrics."

Patents on which the Stamp Duty of £100 has been Paid

1365 Henry Illingworth, of the firm of Daniel Illingworth and Sons, Bradford, worsted spinners, "Improvements in apparatus employed in spinning and twisting worsted and other yarns."

Copyright of Designs.

(Registered during April, 1882.)

Class VI., Carpets.

378,829-31 Edward Webb and Sons, Copenhagen Street, Worcester.
378,955-56 H. R. Willis and Co., Kidderminster.
278,999-9,000 Charles Harrison, Stourport, Worcestershire.
379,258 T. and M. Hutchinson and Co., 5, Bread Street, E.C.
379,330 John Crossley and Sons (Limited), Halifax.
379,326 A. F. Stoddard and Co., Elderslie, N.B.
379,428-29 The Heckmondwike Manufacturing Company (Limited), Heckmondwike.
379,514-16 H. and M. Southwell, Bridgnorth.
379,571 A. F. Stoddard and Co., Elderslie, N.B.
379,665 M. Whittall and Co., Kidderminster.

Class XI., Furnitures.

377,749 Daniel Lee and Co., Fountain Street, Manchester.
378,883 Daniel Lee and Co., Fountain Street, Manchester.
378,964 Daniel Lee and Co., Fountain Street, Manchester.
379,005-9,006 The Rossendale Printing Company, Manchester.
379,033 Herridge and Cornall, Bolholt Works, Elton, Bury.
379,034-5 Daniel Lee and Co., Fountain Street, Manchester.
379,091 Salis Schwabe and Co., 41, George Street, Manchester.
379,217-18 F. W. Grafton and Co., 91, Portland Street, Manchester.
379,414-17 Daniel Lee and Co., Fountain Street, Manchester.
379,508 F. W. Grafton and Co., 91, Portland Street, Manchester.
379,509 Thomas G. Hill and Co., 86, Major Street, Manchester.
379,556 Daniel Lee and Co., Fountain Street, Manchester.
379,768-70 Thomas Hoyle and Sons (Limited), Manchester.
379,801 Edmund Potter and Co., Manchester and Dinting.
379,887 Thomas Hoyle and Sons (Limited), Manchester.
379,886 C. J. Skeggs and Co., Shanghai.

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Lange's Wool-Combing Machinery.

Notices.

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The Publishers will be happy to receive intimations of New Inventions, Patents, &c.

The Publishers are open to receive from Designers, Original Designs of Carpets, Damasks, Tapestries, Linen, Cretonnes, &c., and such as are accepted will be published with the Designers name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

Literary communications must, in all cases, be accompanied by the names and addresses of the writers, not necessarily for publication, but as evidence of authenticity.

Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics* for publication, will be considered as offered *gratuitously* unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers in making enquiries of, or opening accounts with Advertisers in this paper, will kindly mention the *Journal of Fabrics* as the source from whence they obtained their information

To our Readers.

Numerous inquiries having been made for back numbers of the Journal, we beg to inform our readers that all the numbers from the commencement to February are out of print. We have however reprinted our designs and have a stock of 18,000 copies on hand, which we shall be happy to supply in the order in which they were originally published, at 6d. per set, each set representing one month's issue.

Technical Education.

IT would be difficult to overestimate the necessity that exists for some national plan of Technical Education. The efforts that have up to the present been made are more or less spasmodic in their character, and owe their origin, not so much to the universally felt want of some such system, as to the zeal and enterprise of a few of the most prominent of our manufacturers; and even then we fear that only in those trades in which the foreigner has made himself felt by stern competition, have we done anything worthy of the name of Technical Education. It is only in the textile manufactures that we have made any effort to keep the position we have attained, by some organised system of instruction. and when one considers the careful training that has for so long been given to the German and French artisan, the wonder is not that we are now equalled by others, but that we have not long ago been surpassed. The secret, we make no doubt, is in the native ability that exists, and the superior character of the oversight that has for so long been exercised.

England, in adopting a national system of technical instruction, would find the want of a good primary education the greatest drawback. Many thousands of half timers in Leeds, Bradford, Huddersfield, and other of the West Riding towns, are certainly incapable of reading with fluency and expression, and are in as gross a state of mental fallow as can well be conceived. Yet this is the material out of which the technical teacher is expected to raise up a skilful and reliable workman. In Germany, the State is not satisfied with the oversight of the boys while at school, but follows and controls them even after they have left school, so that any want of diligence and attention to duty in the day school must be compensated for by the greatest industry and perseverance in the evening school, no boy being allowed to leave school, evening or day, until he has satisfied the examiner that he possesses a good primary education. This point being attained, the work of further instruction becomes comparatively easy, to whatever branch it is desired to give attention. So far as Yorkshire is concerned, we only know of three places where Technical instruction will be available within a reasonable time; and those are Bradford, Leeds, and Huddersfield. Thanks to the munificence of private individuals, there exist several valuable scholarships at Leeds and Bradford for promising students; and we believe in almost every instance, these scholarships have been taken by boys whose parents have been well able to maintain their sons at the school. Of this of course we don't in the least complain, if the son of the rich man have brains sufficient to carry him through, by all means give him every assistance on his way, but it is very depressing and disappointing to find that the large class who we expected would be most benefitted by these schools, should have taken so little advantage of the opportunity offered. Of all the various aids offered by the Government to the scholars in the primary schools, for the prosecution of scientific studies we can find no single school in the country, in which these have been taken advantage of. This may of course arise from several causes—(1). The parents and scholars may, and we believe are ignorant of the existence of these scholarships—(2). The present local burdens are at present too great to admit of any set plans of general subscriptions for such an object, and (3.) The efforts required to compass the work in the ordinary way, without extending the subjects of study. In past times so long as the control and direction of primary education was left to willing but irresponsible hands, so long was it found incomplete and imperfect, and it is only when the fact becomes patent to the most casual observer, that we are falling behind in the educational race, that a measure of the nature of Forster's Act becomes an absolute necessity. So it will be with Technical Education, private enterprise will do its best, enthusiasts will exhaust their resources, and yet the major part of the work will remain undone. The establishment of a complete national system of technical instruction cannot long be delayed, and the sooner it is initiated the sooner shall we be able to start with reasonable prospect of success to meet the foreigner "on his own ground and beat him on it."

The revival of industry in Italy is witnessed in various ways at present. According to *Les Moudes*, Baron Cantoni, impressed with the fact of Indian cotton going past Italy to England to be spun and returned as thread, has formed in Venice a cotton-spinning company, under the name of "Cotonificio Veneziano," with a capital of ten million francs. The first factory has been built, and will receive 80,000 spindles. At Venice, too, a company for river-navigation has been formed. By means of barges, towed by steam power, to Cavanella, Pavia, and Magadino, it will transport merchandise to the foot of the Gothard, saving a third of the cost of railway-carriage from Genoa. Lately, for the first time, railway carriages of national make were exhibited at Milan; but the axles and wheels, it was stated, came from France. The last financial statement in the Chambers, by Signor Magliani, showed that the floating debt had diminished about 100 million francs in three years; that the exportation and importation balanced each other for the first time; and that the receipt of imposts exceeded the ordinary expenditure by 49 million francs.

Messrs. J. S. and S. Smith, Carpet and Rug Manufacturers, (formerly of Thistle Street, Glasgow), we are requested to state have removed to Nursery Mills, South York Street, Glasgow.

SILK.

(*Continued from page* 101).

Although the manufacture of silk was introduced into England in the reign of Henry VI., still the goods produced were insignificant. A law passed in 1454 A.D., for protection of the silk women of London, prohibiting the importation of silk goods for a period of five years notices only trifling articles, such as twined ribbons, chains or girdles. Another such act was passed in 1463 (Edward IV.), from which we learn that the manufacture of silk goods had increased, as the forbidden importations consisted of laces, ribbons, fringes of silk, twined silk, silk embroidered, tires of silk, purses, and girdles. In 1482 this act having been repealed, articles of superior manufacture were imported from foreign countries, and home silk artisans were thrown out of employment. In consequence of the distress which followed, another prohibitive act was passed for four years. In 1509 we again notice a further increase in the articles manufactured. Another act was passed, prohibiting the importation of any manner of silk, wrought either by itself, or with any other stuff, in ribbons, laces, girdles, corses, and corses of tissues or points; but the importation of all other kinds of silk, as well as raw and unwrought, was declared lawful. In 1608 (James I of England), was desirous that the silk-worm should be introduced into this country, feeling certain that success in the rearing of it depended only on a sufficient supply of mulberry trees: he therefore issued circulars to all the counties to procure and cultivate the plants, this was done in many parts of the country, and in due time the worms were also introduced, but owing to the coldness of the climate the attempt proved a failure. Since the time of King James, similar attempts have been made in England and Ireland by Societies and Companies, but have proved fruitless. If no other difficulty stood in the path of success, the high price of labour in Britain must prevent an undertaking, which requires such incessant care, from proving remunerative. James was anxious that the silk-worm should also be introduced into his American colonies, therefore, in 1622 he wrote a letter to the Virginian Company, advising them to give their attention to the cultivation of mulberry trees, the rearing of silk-worms, and the production of silk, rather than to the growth of that "pernicious weed" tobacco. Trees were planted, but very little silk was produced, and the dissolution of the Company put an end to the experiment. It was revived in 1654, and again failed, probably as has been suggested because the growth of tobacco was more profitable. The manufacture of raw silk into broad silk seems to have been begun in Britain towards the close of the reign of this monarch, who by giving encouragement to a London merchant, enabled him to bring from the Continent silk throwsters, dyers, and weavers of broad silk, and so much success attended his plans than in 1629, (Charles I.), the throwsters were so influential that they united themselves into a body, styled the "master, wardens, assistants, and commonality of silk throwers." In 1661 the silk throwers in London employed 40,000 hands, and it was agreed that no one should commence the silk business without serving a seven years apprenticeship. The revocation of the edict of Nantes, though a great evil to the Huguenots, as we have before stated gave the greatest impetus to the silk manufacture in the country. The superior skill and knowledge of these French refugees tended greatly to the improvement of the silk manufacture, and goods which had formerly been imported were now made at home, such as velvets, lustrings, brocades, satins, ducapes, &c. By 1713 (Anne), so great had been the increase in the trade, that a petition presented by the Weavers' Company to Parliament, stated that "the silk manufacture was twenty times greater than in 1664, that all sorts of black and coloured silks, gold and silver stuffs, and ribbons, were made as good as those of French fabric; that black silk for hoods and scarfs, which twenty-five years before was all imported, was now made here to the annual valve of more than £300,000, thereby, a great increase had been occasioned in the exportation of woollen and other manufactured goods to Turkey and Italy, whence the raw silk was imported." Although there had been a steady improvement in the manufacture of silk from the time of its introduction. Still as late as the early part of the eighteenth century weavers had been, in consequence of the deficiency in English machinery, dependent chiefly upon Italy for thrown or twisted silk. But a man named Crochet made an unsuccessful attempt to remedy this defect. Another in 1715 (George I), named Lombe, visited Italy in the hope of being able to procure such information as would enable him to make the necessary machinery. At length by bribing two Piedmont artisans, he gained secret access to one of the mills, and in time achieved his desire, but no sooner had he done this than the object of the visit to the country being discovered, he, along with his accomplices was obliged to flee, their lives being in danger. Mr. Lombe erected a mill at Derby, set up his machines, and obtained a patent for their use for 14 years. The machinery was turned by a water wheel, and it is said that 318,504,960 yards of silk were thrown daily. Mr. Lombe did not live long after the building of his mill, he was succeeded by his brother, and he by Sir Thomas Lombe, who, before the expiration of the patent, petitioned Parliament to grant him a renewal, pleading that so much time had been spent in perfecting the machinery, and in teaching the people that but little had been left for deriving pecuniary benefit therefrom. Parliament, willing to deal liberally with the family of one, who had conferred so great a boon upon the nation, granted him, instead of the renewal, £14,000 on conditions that he would allow a model of the machinery to be taken, and a knowledge of the invention to be spread. After the introduction of the throwing machine, so great was the improvement in the silk trade, and such was the demand for the raw material, that Parliament in order to induce Georgia, and South Carolina to produce silk in those colonies passed an act, by which it was allowed to be brought into London free of duty. The supply from this source, however, was of short duration, a bad season or two and the inferior quality of the silk discouraged the rearers and caused them to abandon the persuit of this precarious occupation, and to turn their attention to the raising of cotton which was introduced about this time. In later times, high prohibitive duties were levied by the desire of the weavers on foreign manufactured silk goods, thus the English were certain of supplying the home, and to some extent the colonial markets also. The demand being equal to the supply there was no inducement for mechanics or weavers to turn their attention to improving the machinery in connection with the art, but in 1824 the high duty on raw silk was reduced to a nominal one, that on thrown silk was reduced one-half, and foreign manufactured goods were admitted into the country after the 5th of July, 1826. Then our silk traders were compelled, if they would not be driven out of the field altogether, to turn their attention to improvements, and the result has proved that incitement only was needful to develope the skill of our silk artisans, to enable them to produce goods quite equal to those of foreign manufacture.

Imports of Cotton, Woollen, Silk and Flax, into the United States.

The New York *Bulletin* compiles from the official reports of the Bureau of Statistics the returns showing the imports of cotton, woollen, silk, and flax manufactures, into the whole United States, during the eight months ended February 28. The total invoiced value of these four classes of textiles imported in that time were as follow:—

Manufactures of—	1882.	1881.
Cotton	$23,009,589	$21,430,227
Wool	26,828,541	23,890,662
Flax	12,324,736	11,106,311
Silk	26,344,872	23,134,622
Total	$88,507,738	$79,561,822

These figures show that there was a gain in importations in these eight months amounting to $8,945,916, equal to over 11 per cent. The largest increase in value was in silk fabrics, followed in succession by woollens, cottons, and flax goods. In cottons there was a liberal increase in jeans, denims, &c., and coloured and uncoloured cottons also showed an increase, while in hosiery

there was a material falling off. "Other manufactures of," in which laces, embroideries, and thread form an important share, there was a gain of about 1¾ millions. In woollens the most noticeable change was in dress goods, the importations of which were from $9,182,768 in the eight months of 1881 to $11,711,385 during the same part of the present fiscal year. The quantities were 37,877,215 yards and 46,272,379 yards respectively. Cloth and cassimeres remain at about the same figures, and shawls, carpets, and hosiery exhibit a decline. Linens increased from $11,106,311 to $12,324,736, and silks gained somewhat over three millions, the principal portion being, of course, included in piece goods. The exports of cotton goods for the same time indicate a decline of 3,701,350 yards compared with the proceeding year.

Silk Weaving in Persia.

The manufacture of carpets and shawls, and silk weaving and artistic embroidery, are the two most important branches of industrial art in Persia. The Persian carpet industry is celebrated in Europe, while the actual products are much inferior to those of past centuries. The beautiful carpets of the olden times, which were celebrated as much for the fineness of the work as for the elegance and originality of the designs, are already, even in Persia, rarities. There will be found interesting examples in the mosques of the towns, and in the places of the most ancient pilgrimages: but these are concealed treasures, as the fanaticism of the Persians forbids the entrance of Europeans in their national sanctuaries. The industry still yields perfect products, it is true, but they often show a lamentable want of care in making them; the designs are a little too regular, and the carpets are either altogether crisp or stretched too much.

The crisped carpets are much less in price, and they are nearly always such models that they are peddled in the houses to cheat the yet inexperienced strangers. The use of aniline colors has lately much diminished the value of the carpets. The Persian government adopted a wise measure, a year ago, in forbidding the importation of these colors.

The shawls are proportionately larger in number, as they are not so much sought for in Europe; but the best have never equaled for beauty and fineness those of Cashmere. Kirman is especially the centre of this industry, there being produced there also a coarser and cheaper kind.

There remain only, as specimens of these ancient tissues of magnificent silks and brocades of silver and gold, small fragments, discolored and worn, but which are valuable because of the fine metal they contain. They are principally remnants of the robes of honor which the ancient sovereigns of Iran were accustomed to give on great occasions to the dignitaries of the kingdom. The custom of rewarding all personal services by gifts of magnificent robes of honour made the silk weaving industry flourish. This has fallen in disuse, and with it has suffered this industry. Only in exceptional cases are gifts made of fine shawls or vestments of honour. The prosaic bag of gold or the more modern ornament of orders have replaced this ancient custom.

The products of the artistic Persian embroidery in gold, silver and silk were always in favor, and this art was formerly encouraged by the luxury which prevailed in the rugs for prayer, clothing, and the caparisoning of horses, &c. Some admirable specimens of the most prosperous times still may be found. The magnificence has now diminished, and they are content to cover their horses with less precious fabrics manufactured at Rescht, and called "Reschter."

These are goods composed of pieces of cloths of different colors, arranged in mosaic work, embroidered with rich ornaments and flowers. They are used not only as coverings for horses, but also to upholster divans and cushions, and as tent stuffs, hangings, table-covers, &c., and they can be of any size and color. Usually the *tellals* are well provided with this article.

We must mention among the ancient embroideries the short pantaloons of the women, which have long since gone out of fashion, and the designs of which were elegant and original. They have been purchased largely in the last few years for export to Europe, where they are used to cover cushions and arm-chairs. They are worked with admirable care, and they are, as well as the handkercheifs, embroidered in white silk.—*Textile Record.*

The French Ribbon Industry.

The French *Economiste* publishes a very interesting and very comprehensive article on the French ribbon industry and the effects upon it of the heavy import duties on foreign cotton yarns. It would be impossible to reproduce at length the article published by our French contemporary, but the following tables which we quote will serve to explain its general purport and character:—

Production of Ribbons.

	1872. Francs.		1881. Francs.
France	123,000,000	....	125,000,000
Germany	70,000,000	....	60,000,000
Switzerland	65,000,000	....	55,000,000
Austria	22,000.000	....	15,000,000
England	20,000,000	....	20,000,000
Italy, Spain, Portugal, Belguim, Russia, Turkey	10,000000	....	25,000,000
United States	——	....	80,000,000
Total	310,000,000		380,000,000

These figures prove the importance of the ribbon industry to France, and at the same time show the sudden and rapid development of the American production. The following table will show how great the influence has been upon French trade:—

Export of French Ribbons to America.

	Velvet Ribbons. Francs.		Lustring Ribbons. Francs.
1871	8,783,663	....	12,153,186
1872	4,268,691	....	16,762,833
1875	591,485	....	6,920,459
1881	92,084	....	3,566,676

It will be perceived that the exports of velvet ribbons have declined much more considerably than those of lustring, this being accounted for by the fact that the velvet always contains more or less of cotton, the duties on which have long acted as a serious impediment to the development of the French trade. This fact is further illustrated by the following table of general exports:—

Velvet Ribbons.

	All Silk. Francs.		Mixed with Cotton. Francs.
1875	2,237,480	....	4,497,460
1876	2,665,740	....	1,116,995
1877	2,243,565	....	400,650
1878	1,974,700	....	1,463,405
1879	1,576,820	....	1,450,323
1880	1,418,900	....	1,601,600
1881	1,104,880	....	781,800

The exports of pure silk ribbons, it will be seen, are maintained without much reduction, whilst those mixed with cotton have declined very considerably. This is the more remarkable because cotton velvets have been much more generally used during the last few years than pure silk velvets, which proves conclusively that the decline is owing to the fact that the cotton yarns required for the production are burdened on admission into France with a duty equivalent to 18 per cent. ad valorem, whilst in Germany and Switzerland the duties are not equal to 1 per cent. This decline will therefore be further aggravated in a most serious manner by the new tariff which came into force on the 15th of May last, and this explains the determined opposition which St. Etienne and Lyons, the two centres of the French ribbon industry, have offered to the promulgation of the new tariff.—*Manchester Examiner and Times.*

On the 1st of June, the limits of weight and size allowed for packets of trade patterns or samples addressed to Switzerland and sent *via* France was increased to those which have been adopted for patterns addressed to France, Portugal, Belgium, Greece, Luxemburg, and the United States of America. The maximum weight of each packet was raised from eight ounces to twelve ounces, and the maximum dimensions from eight inches to twelve inches in length, four inches to eight inches in width, and two inches to four inches in depth. In all other respects and conditions regulating the transmission of trade patterns or samples to Switzerland through the post remain unaltered, and the old limits of size and weight still applies to patterns and samples sent to Switzerland *via* Germany.

Wool-Combing Machinery.

*On Wool-Combing by Modern Machinery.**

By Mr. F. M. T. Lange, of St. Acheul-les-Amiens

THE combing of wool by machinery has made such vast progress towards perfection, that it will be unnecessary to do more than touch upon the old process of combing by hand; but a few words may be devoted to this subject, in order to give a clearer idea of the work to be performed on the raw wool

The wool, after having been washed, is in a very tangled state, and full of little knots and burrs, technically called buttons, neps, or motes. It therefore requires to be straightened out, and to have the buttons, neps, or motes removed from it; and this can only be done by passing a comb through the mass many times.

The wool works much more kindly if the combs (which have steel teeth) are warm, and a little oil is put on the wool; hence in former days three hand-combers generally worked around one "fire pot," with burning charcoal in it, and each man placed one of his hand-combs on the edge of the pot to get warm whilst he was using the two others. Of these, one comb was placed on a projecting vertical spike attached to a post (or the "pad post" as it was called) with its teeth standing upwards; and into this the comber lashed or struck the end of a bunch or body of wool which he held in his hand, until the comb was loaded. He then took a warm comb, and repeatedly passed its teeth downwards, first through the end of the fringe or mass of wool in the fixed comb, and then gradually closer and closer up to the teeth; thus not only getting all the "buttons," which he had combed out of the wool, well into and behind the teeth of his own comb, but also combing out about half of the wool from the fixed comb into his own comb. He then placed the comb he had been working with on the post; and taking the third comb fresh and warm from the fire, proceeded exactly in the same way with this, until it became loaded in its turn. He then fixed this last comb on the post, and proceeded to draw off the projecting fringe of wool (or "milk it off" as it was sometimes called), drawing it off with his fingers and thumbs into a long and nearly clean sliver of wool. This clean wool is called top. The above process cost about 2s. 6d. a pound to do, and sometimes had to be repeated. In France it was common to take out any "buttons" remaining in the sliver after combing with the lips, the sliver being up against the light by the two hands in order to discover them. The process was called "nactage." The wool and impurities which remain im the comb after drawing off are called "noil," and are sold to cloth makers, who require a somewhat "fuzzy" thread for cloth, and not a long smooth fibre like that used for merino, mousselaine-de-laine, serge, worsted, &c.

The first wool-combing machine was invented by the Reverend Edmund Cartwright, of Doncaster, in the year 1790, and he afterwards made further improvements in it. This is the same Edmund Cartwright who invented the surface condenser for steam engines and the power loom, &c. His combing machine was described shortly in a paper by the late Mr. Benjamin Fothergill. It was an exceeding ingenious machine, considering that it was the first to deal with a material which until that time had only been treated by hand; and the motions that were adopted were evidently in imitation of the hand motions in combing. Thus the "crank lasher" has a pair of small feed rollers to deal out the sliver as the "lasher" lashes it into the receiving comb, which stands in the place of the fixed hand comb. This is a large circular comb travelling slowly round, and having its teeth horizontal, and pointing inwards. The wool is worked or cleaned by a conical working comb, which moves in a vertical circle, with the points of its teeth towards the points of the teeth of the circular receiving comb. This conical comb not only brings the wood round to be combed, but when combed carries it on to the drawing-off rollers, where it is drawn off in a clean sliver or "top," leaving the noil and dirt in the comb, from whence it has afterwards to be removed.

Mr. Cartwright made several improvements in his machine, but met with great opposition from the hand combers. A Bill was presented to Parliament to suppress combing by machinery, but was thrown out by a large majority. The combing by this machine was not by any means perfect, nor indeed was the work done by hand perfect, but often had to be done twice over, causing great expense and loss of wool.

A little later, Hawksley, of Nottingham, improved this machine, though still leaving much to be desired; his machine was made by Robert Ramsbotham, who it appeared did not think well of it It was not until long after this that any combing machine worked at all on the true principle for obtaining really clean "top;" and it was still later that a machine was invented to take out all the "top," and thus leave none of it mixed with the noil.

The next combing machine that deserves notice, and in fact the first that was in any degree satisfactory, was not brought out for thirty years after Cartwright's. It was invented by Godart, of Amiens, in France, in 1823, and was patented here in 1827 by John Platt. It was made by Collier, and was called "Collier's comb." Some of these combs were at work as late as 1854, or perhaps a little later, in this country. The machine was of very simple construction. It consisted of two large circular and cylindrical combs (that is to say, combs in which the teeth stood up like a crown parallel with the axis) and two pairs of drawing-off rollers and nothing more. The combs, which were heated by steam, were set with their peripheries running near each other, and their teeth pointing towards each other, but with their axes somewhat inclined to the horizontal in opposite directions. Thus, when one comb had been loaded with wool, which was lashed into it by hand, the teeth of the other comb, as the two combs revolved, would enter the wool, and then, as the teeth separated, would comb it out, leaving the projecting fringe comparatively clean and free from buttons and neps. The combs were gradually advanced towards each other, so as to comb closer and closer up to each other. Finally the combs were stopped, and the "drawing-off rollers" were advanced; the fringes of wool on each comb being entered between its drawing-off rollers, the rollers were started, and drew off a sliver of "top" from the comb, the comb revolving very slowly until it had made one revolution. By this time all the "top" had been drawn off from it, and its teeth were then stripped of the remaining noil, and reloaded with wool to start afresh. With this machine the noil often amounted to 33 per cent. in weight of the cardings, *i e*, of the wool as brought to the comb, after it has been freed by washing and carding from dirt, tar, sand, stones, and rubbish. This comb was more suited for low and long wools, and one great objection was that the wool was imperfectly done, and that the action was intermittent.

* Paper read before the Institution of Mechanical Engineers:

(To be continued.)

National Exhibition at Turin.

An influential general committee has been formed, with the Duke D'Aosta as President, for holding a purely national Exhibition at Turin, in the summer of 1884, as a compliment to that of Milan last year. The Parco del Valentino is proposed as the site, and the buildings are to cover double the area of the Milan Exhibition. The idea is progressing beyond expectation, and the shares of the guarantee fund are reported to be taken up well. An appeal to co-operate is made to industrial, scientific, and artistic institutes, chambers of commerce, and agrarian councils. Local committees, with power to send delegates to the executive council, are to be formed throughout the country, for serving as an intermediary between the management and exhibitors: for interesting the population in the undertaking, whether as exhibitors or otherwise; for deciding on the admissibility and quantity of proposed exhibits, thus avoiding expense and disappointment; for assisting producers in preparing and forwarding their exhibits, and especially for ascertaining that the articles sent are really of Italian production. Another, and important office of the local committees, will be to obtain and impart information as to improved processes of manufacture, and as to foreign markets for produce. All natural products will be admitted, with a few obvious exceptions, a limit being put upon the quantities of stone, ores, metals, &c. The Art Commission make an appeal to Italian artists to contribute to the Fine Arts Exhibition that will be held in connection with a collection of ancient works of art. Consuls in other countries are also urged to interest foreigners in the Exhibition, and induce them to visit it.

The Weaving of Raised Figures on Fabrics.

An improved method of weaving raised white figures upon a coloured ground, the colours being reversed at the back, has been patented and the specification issued recently. The fabric is made with two shuttles, one carrying a coarse and the other a fine weft. It requires four picks to form the pattern. There are also two warps, one fine and one coarse. The face of the fabric has a corded ground formed by both warps being interwoven with the fine weft, whilst the pattern is formed of a separate and distinct cloth woven with the coarse weft and warp only, whilst the fine weft and warp make a separate cloth at the back; the figure is thus raised, and a "pocket" is formed between it and the back cloth. The cloth is woven in a loom provided with a jacquard machine and two healds as follows:—

In the first pick a shed is made with the machine up, and one heald raised; one pick of thick weft is put in this shed; another shed is then made with the machine up, but the first heald is lowered and the second heald raised; these two healds form calico and bind the thick weft which has gone through, and which forms the figure on the cloth. The machine then goes down, and one of the pressing boards comes up along with both the healds; a pick of fine weft is put through this shed; the first presser board then goes down, and the second presser board comes up, the two healds still remaining up; another pick of fine weft is put through this shed. These two fine picks form the ground. Two warps are used in making the cloth, the first (the back warp, which is put in the mounting attached to the machine) is used for forming the figure on the cloth, along with the thick weft, and the second (the face warp, which is put through the healds) is used for binding the figure on the cloth. There are consequently four picks, in which the machine is up two picks and down two picks, and the pressing boards are up alternately one pick and down three picks, and the two healds are down one pick alternately and up three picks The two pressing boards weave calico in the two picks in which the machine is down, and the fine weft is put through these two sheds and forms the ground. The yarn is drawn in the reed in the following manner:—Two ends from the back warp and one end from the face warp are drawn into one dent or space of the reed, the fine end from the face warp being drawn between the two ends from the back warp. The figure in the cloth is therefore made with the thick weft, the yarn in the mounting being left down where the figure is required, the ground is made with the fine weft; the yarn from the back warp weaving calico.

A similar fabric to the one described above may be woven with one shuttle only, which requires three or more picks to make the pattern.

This cloth is made with two or more ends in one dent or space of the reed and two warps. One end (or more) is taken from the back warp and is put through the mounting, and one end (or more) is taken from the face warp and put through the healds. The machine is lifted up and one of the healds raised, and a pick of the weft is put through this shed; another shed is then made with the machine still up, but the first heald is put down and the second heald raised; another pick of the weft is then put through this shed; the machine then goes down, and both the healds come up, and also one of the pressing boards, when one or more picks are put through this shed. The machine is then lifted again, and the first heald raised and another pick of weft is put in; another shed is then made, with the machine still up, but the first heald is put down and the second heald raised; another pick of weft is then put through this shed; the machine then goes down, and the second pressing board is lifted up, when one or more picks are put through this shed.

The summary return of the French imports for the past four months of the current year has been published. The return, compared with the corresponding one of last year, is as follows:—

	Imports. 1882. F.		1881. F.
Food	312,999,000	..	553,747,000
Raw Materials	780,714,000	..	736,925,000
Manufactures	234,992,000	..	169,510,000
Miscellaneous	89,174,000	..	79,534,000
Total	1,617,879,000	..	1,539,716,000

	Exports. 1882. F.		1881. F.
Food	259,387,000	..	241,319,000
Raw Materials	237,864,000	..	197,880,000
Manufactures	613,576'000	..	525,553,000
Miscellaneous	44,488,000	..	57,499,000
Total	1,155,315,000	..	1,022,251,000

There has thus been an increase of 78,100,000f. under imports, and of 133, 000,000f. under exports. The chief increase under both imports and exports is in manufactures.

The Manufacture of Gold and Silver Lace, and Fancy Trimmings.

A Paris paper calls attention to the decline of an industry which was once a source of great profit to the city of Paris—the manufacture of gold and silver laces and fancy trimmings. In 1880 this trade was extremely prosperous, over 1,200 persons being employed by it in Paris. Then the workmen, imagining that they were underpaid, demanded an advance of wages, which the manufacturers declared that they were unable to grant. The workmen then went on strike, and have not up to the present day returned to their industry. The manufacturers, unable to obtain the execution of their orders at home, sent them to St. Etienne and other places where the same trade was carried on. The Paris workmen urged their colleagues of St. Etienne to assist them by striking also for higher pay, and the latter did. Then manufacturers had no alternative but to take their orders to England, Germany, and Belgium, where they are executed more cheaply than they could be in France if the workmen were paid the wages claimed. The result is that now, of the 1,200 workmen formerly employed at Paris in this trade, not 80 are now working. The moral of the tale is an instructive one that will bear examination.

SCIENTIFIC AND ART NOTES.

* * * *

The Municipal Council of Mieras in Spain has decided to establish a school for training mechanical and mining engineers, foreman of works, engine drivers, and firemen.

* * * *

The telephone system in Vienna, although only about three months' old, has 224 subscribers in communication. This is a more rapid rate than Berlin, which began in April 1880, and has now 668 subscribers. A full account of the Paris telephone system has been given in *L'Electricien*.

* * * *

A paper has been read at the Society of Arts by Mr. Bolas, F.C.S., on "Fire Risks and Electric Lighting," the chief practical value of which was that all the experiments made to show dangers by electric lighting either wholly failed or were exceedingly difficult of accomplishment.

* * * *

It is not well known that copper pipes for steam heating are less adapted than iron pipes, notwithstanding that copper is a better conductor of heat than iron. Mr. Walther Meunier, of Mulhouse, ascribes this to the fact, that the power of radiation for iron is about three times greater than that of copper.

* * * *

The *Roosski Kooryer* ("Russian Courier") says that 1,915 students finished their courses of study in the St. Petersburg Technological Institute since its foundation. Most of these certificated engineers have found good employment in Russian factories. The taste for technical education is rapidly developing itself amongst the Russian people, and every year the number of students is greater. During the last few years it has increased from 500 to 600 per annum.

* * * *

A Brazilian exhibition is being organised in Berlin for October to December this year, by the Central Society of Commercial Geography. Prominence will be given to the raw materials which Germany does not, or not sufficiently, produce, and for which Brazil is so eminently adapted, *e.g.*, ores, cotton, coffee, cocoa, tobacco, hides, silks, and tanning materials. Opportunity will be given to German merchants of finding how their share in importation from Brazil may be advantageously increased. By means of books, maps, pictures, models, photographs, &c., a full representation of the country and its population will be aimed at. In Antwerp, an international exhibition of all subjects connected with gymnastics takes place in August.

* * * *

A permanent international exhibition is being organised at Cologne, or rather at Ehrenfeld, one of the Cologne suburbs. The exhibitors can take space for a year, three years, six years, or even nine years, and renew the objects exhibited whenever they bring out any improvements. The exhibition is to be divided into nine sections or groups, which include tools, instruments, machines, or apparatus connected with domestic economy, horticulture and agriculture, small industries, architecture, extinguishing fires, &c. Tools and machines connected with the following industries are not admitted into the exhibition:—mines, forges, salt mines, railways, military art, and navigation. The exhibition will not contain tools, &c., used in large works and industries. Finally, it will not admit dangerous, inflammable, or explosive matter.

ORIGINAL DESIGNS.

The first of our designs is from the pencil of Mr. R. Lord, of Gerrard Street, Halifax, and is intended for Tapestry fabric, but could also be very suitably adapted for Cretonne. The colouring will perhaps be best left to the judgment of those manufacturers who care to make use of the design, as great scope is given in the flowers, vase and fans, etc. The design may be shuttled by using a little care in drafting on to ruled paper.

* * * *

The second design is drawn by Mr. S. Garforth, of Lintle Field Terrace, Ovenden, Halifax. This capital sketch is intended for a Royal Axminster Carpet, the colouring of which should be as follows:—The ground dark Maroon, the figure Olive Green, Peacock Blue, Crimson, Pink, pale subdued Buff, Brown and Light Blue.

* * * *

The third plate is from the pencil of Mr. Ezra Hoyle, of Sedgefield Street, Bradford, which may be utilised for a variety of purposes.

* * * *

*** We beg to inform manufacturers and others that adaptations of designs, published in the "Journal of Fabrics," can be made at the Office by experienced Designers, and that Original Designs can also be furnished at moderate charges.

MONTHLY TRADE REPORTS.

Wool.—In the wool trade there is no great change to chronicle during the month; business in English wools has been rather restricted owing to the advent of the new clip, buyers preferring to wait a short time before operating to any great extent. The above applies more particularly to Bradford, Halifax, and the Scotch markets. Prices are fairly maintained, and sellers report that the prices for English wools in the country are ahead of those in the manufacturing districts. The London sales have progressed with animation, the finer sorts of wool have sold fully up to the average of last sales, perhaps a shade higher; faulty and good scoured wools have also sold well. At the Liverpool sales, although there was a good attendance of buyers, prices ruled lower, owing to the large quantity for sale. In Leeds and Huddersfield, although the turnover has not been large, prices have been well maintained. The yarn and piece trades have improved slightly, but prices still are unremunerative.

Cotton.—There has been a fair demand for cotton during the month without any appreciable alteration in prices. Spinners bought rather freely before the Whit-week holidays. Yarns and cloth have sold more freely. The former has, during the latter part of the month, sold fairly well for shipping purposes, the demand being principally for Japan and China. Prices for foreign business are yet very unsatisfactory. A large quantity of cloth has changed hands, but without any great benefit accruing to the producer. Shirtings have been in request for Japan and China. Jaconets have improved slightly both in volume of business and increase in prices. Heavy goods have been in fair request at unchanged prices.

Woollen.—In the woollen trade business has been of a very satisfactory character. Manufacturers of all classes of cloths in Leeds and Huddersfield are fully employed, especially in the latter districts, where they find it a difficult matter to keep pace with the demands for certain sorts. The worsted coating trade is very brisk. Prices for all kinds of goods keep very firm, with a tendency to rise. At Batley business fell off a little after the despatch of goods to France and Austria, and a rather quieter tone prevails, but yet business is in a fairly satisfactory condition.

Linen.—A quieter tone still pervades the market, although the demand for manufactured goods has equalled the production. Prices keep moderately firm. Yarns do not alter much in price, and only a small business has been done in them. There is no change to note in flax. Consumers keep fairly supplied. In jute there is little alteration, business being of small account, with prices unchanged.

Carpets.—Business has fallen off slightly. Many firms are still very busy fulfilling orders. Full time is still the rule. New orders are not obtainable as easily as a few months ago, while old ones are speedily running out. As a consequence prices show a weakening tendency. The depression in worsted yarns continues, although the prices of wools show occasionally a firmness, which ought to have some effect on carpet yarns.

Lace.—Manufacturers of lace are still well employed in nearly all branches of the trade, without having any anxiety from pressure of business as was the case a short time ago. Machinery in the curtain branch is running full time. Valenciennes, Spanish silk, and bugled silk laces are in fair demand at good rates. Irish edgings are slower of sale; but millinery laces of the better classes sell freely, and the commoner sort meet with a fair demand at full price.

Dyeing with Coal Tar Colours.

A patent which received provisional protection only, relates to the dyeing with coal tar colours—particularly those of the diazo kind—of fibres or fabrics in such a manner as to make the material readily take the dye, and so to fix it as to produce fast colours. For this purpose the fibre or fabric is first prepared by impregnating it with fatty or oleaginous matter, or with albuminous, gelatinous, or such like substances, and then fixed by steaming or dyeing. It is afterwards immersed in a solution of acid, preferably organic acid, or of acid salts, or, when oil or fat has been used for impregnating the material, in a solution of alkali or alkaline salts. In some cases the fabrics are afterwards washed, and the dyeing process is then conducted as follows:—The dye bath is prepared by steeping the colour for several hours in acid, organic being preferred, till it attains a pasty consistency. Spirits, glycerine, or other suitable solvent is then dissolved in water, so as to form a bath; in some cases a little acid being added. In the bath thus prepared the fibre or fabric is dyed in the usual manner, and afterwards dried, or exposed to steam or air currents to dissipate volatile matters, and to fix the dye. The dye may be farther fixed by subjecting the dyed material to the same treatment as that employed for preparing it for dyeing.

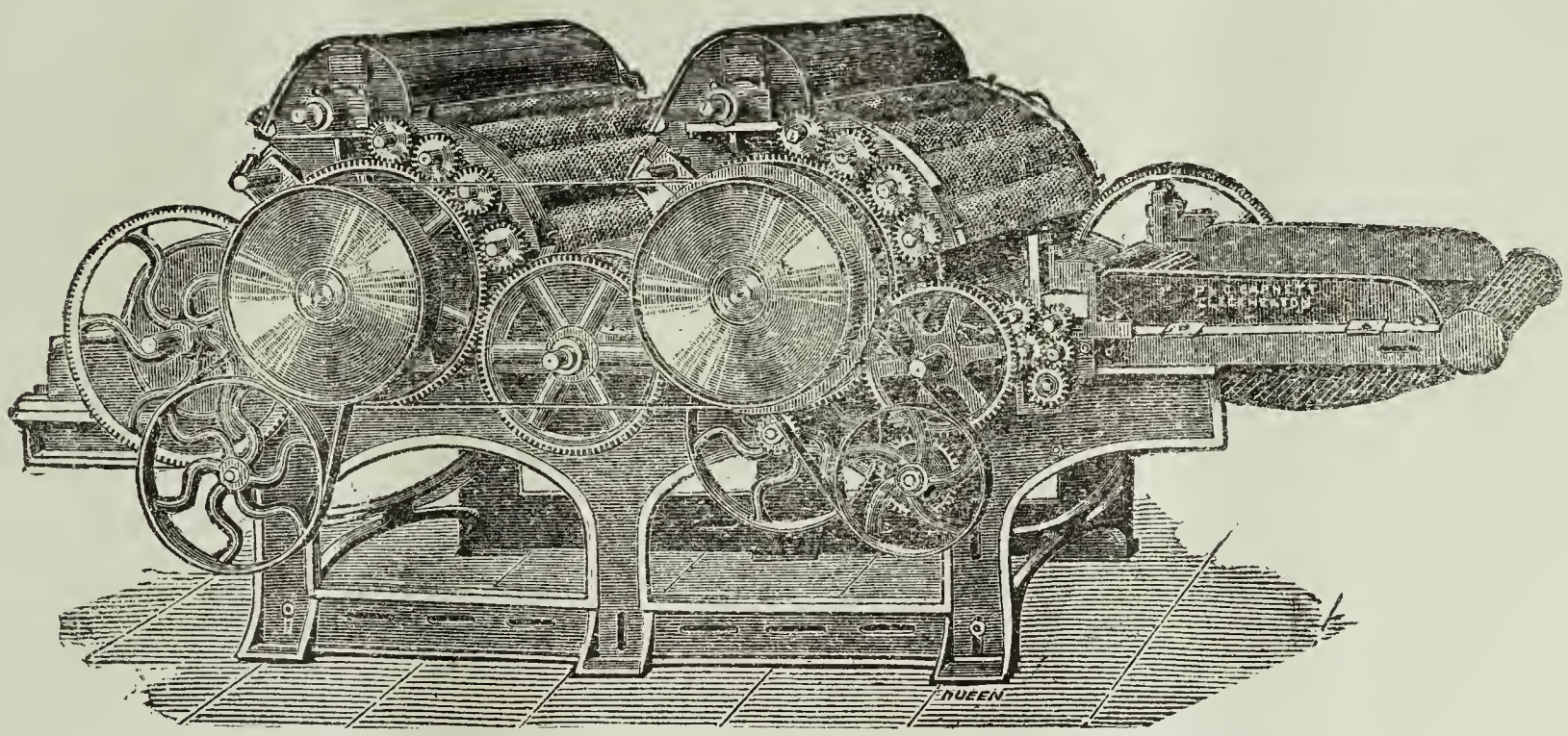
An Improved Apparatus for Wringing Cotton, Woollen, Linen, and other Fibrous Yarns.

An improved apparatus for the wringing of fibrous yarns when in the hank, dyed, sized, or otherwise, a patent for which received provisional protection only, is described as follows:—The material required to be wrung is placed on two hooks after the usual manner, one of the hooks remaining stationary and the other revolving. The stationary hook has attached to it a spring or weight which can be regulated at will to give the requisite tightness to the wringing. The revolving hook is coupled to a pinion which is driven by an internal toothed wheel, and having given the required revolutions the pinion gears in a segment, which reverses the motion of the pinion and thereby also the hook, consequently the yarn is slackened. The pinion then runs out of the toothed gear, causing a "dwell" of the hook, or, in other words, allows the pinion and hook to cease revolving, which gives time to take off the wrung yarn, and to place another hank on the hooks; the pinion then again gears into the toothed wheel, and wrings the hank as before. Instead of the internal toothed wheel a right and left hand screw may be used, which may be driven by a worm and worm-wheel, or other gearing to give a rotative motion.

MACHINE "GARNETT"

For Opening Hard Twisted Woollen and Worsted Waste.

À ouvrir les laines fortement frisees et les dechets de laine.



These Machines are guaranteed to be of the very best quality, both as regards material and workmanship, and possess many recent improvements.

We beg to announce that we have just obtained

ROYAL LETTERS PATENT

For improvements in these Machines, whereby we are now able to put 14, 16, and even 24 rows of teeth per inch on to the cylinders, whereas formerly we could not exceed 12 rows per inch.

Ces machines sont garanties de première qualité, sous le rapport du choix des matériaux et de la construction. Elles renfermcnt plusieurs perfectionnements tout nouveaux.

Nous venons d'obtenir

UN BREVET ANGLAIS

Pour un perfectionnement au moyen duquel nous pouvons placer 14, 16 et jusqu 'à 24 rangs de dents au pouce sur les cylindres, tandis que jusqu 'alors nous ne pouvions dépasser 12 rangs au pouce.

P. & C. GARNETT, Sole Patentees, Cleckheaton, Yorkshire,

WHO ARE ALSO MAKERS OF

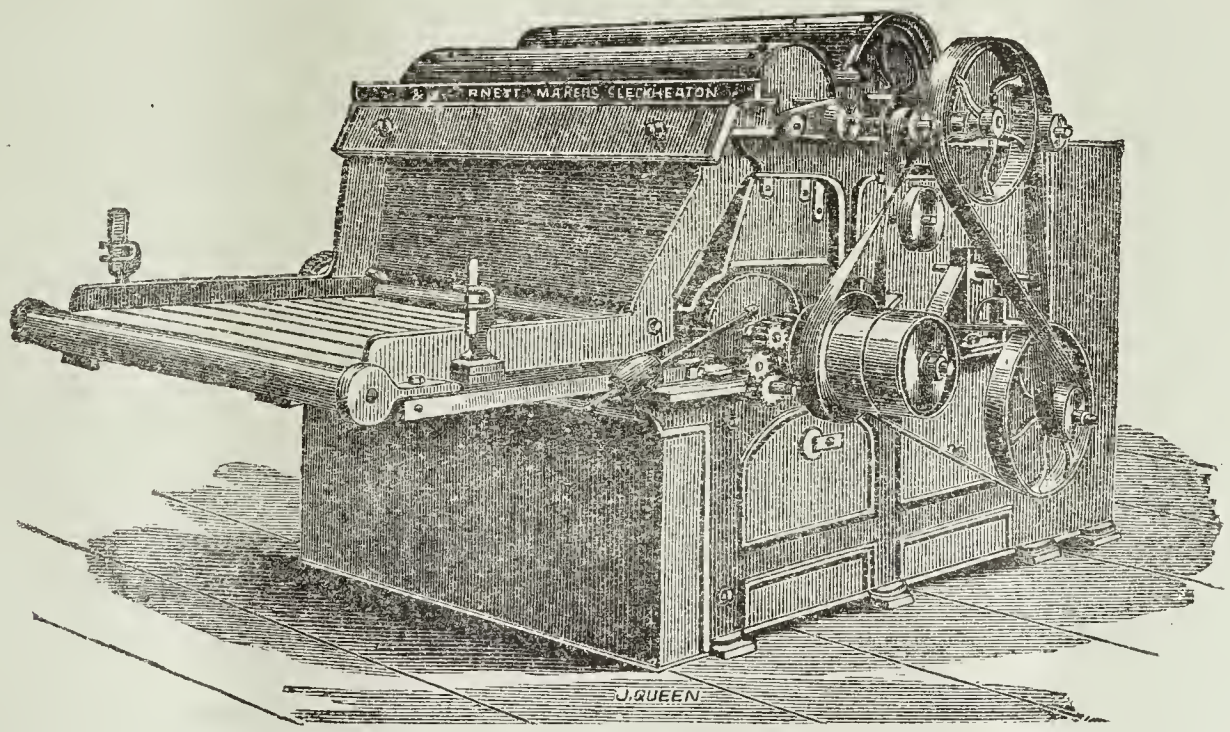
GARNETT'S PATENT COTTON GIN,

Unequalled for fast Seed Cotton.

NOUS CONSTRUISONS AUSSI

L'EGRENOIR BREVETÉ DE GARNETT

Sans rival pour la préparation des cotons á graine dure.



IMPROVED WOOL CLEANING AND BURRING MACHINE,

Capable of cleaning 1,500 lbs. to 1,600 lbs. of Wool per day. The very best and most economical machine for this purpose which has yet been introduced to the public. Also

GARNETT'S PATENT METALLIC CARD,

For covering burr rollers and breasts of carding engines for woollen and worsted, and

TAKERS-IN OF COTTON CARDING ENGINES.

From Mr. ROBERT PLATT.

Stalybridge, May 9th, 1877.

In answer to your inquiry of the 7th, I have had your patent Metallic Cord in use more than *twenty years*, and am very much pleased with the working of it. Its advantages are that it is much *cleaner* and *less costly* than leather or any other covering.

LA MACHINE PERFECTIONÉE À NETTOYER ET ÉCHARDONNER LES LAINES,

Pouvant nettoyer 1,500 à 1,600 livres de laine par jour. C'est la meilleure machine et la plus économique qui ait jamais été offerte pour cet emploi à l'industrie. Nous construison aussi

LES CARDES MÉTALLIQUES BREVETÉES DE GARNETT,

Pour garnir les alimenteurs, et poitrinières des cardes à laine et à laine peignée

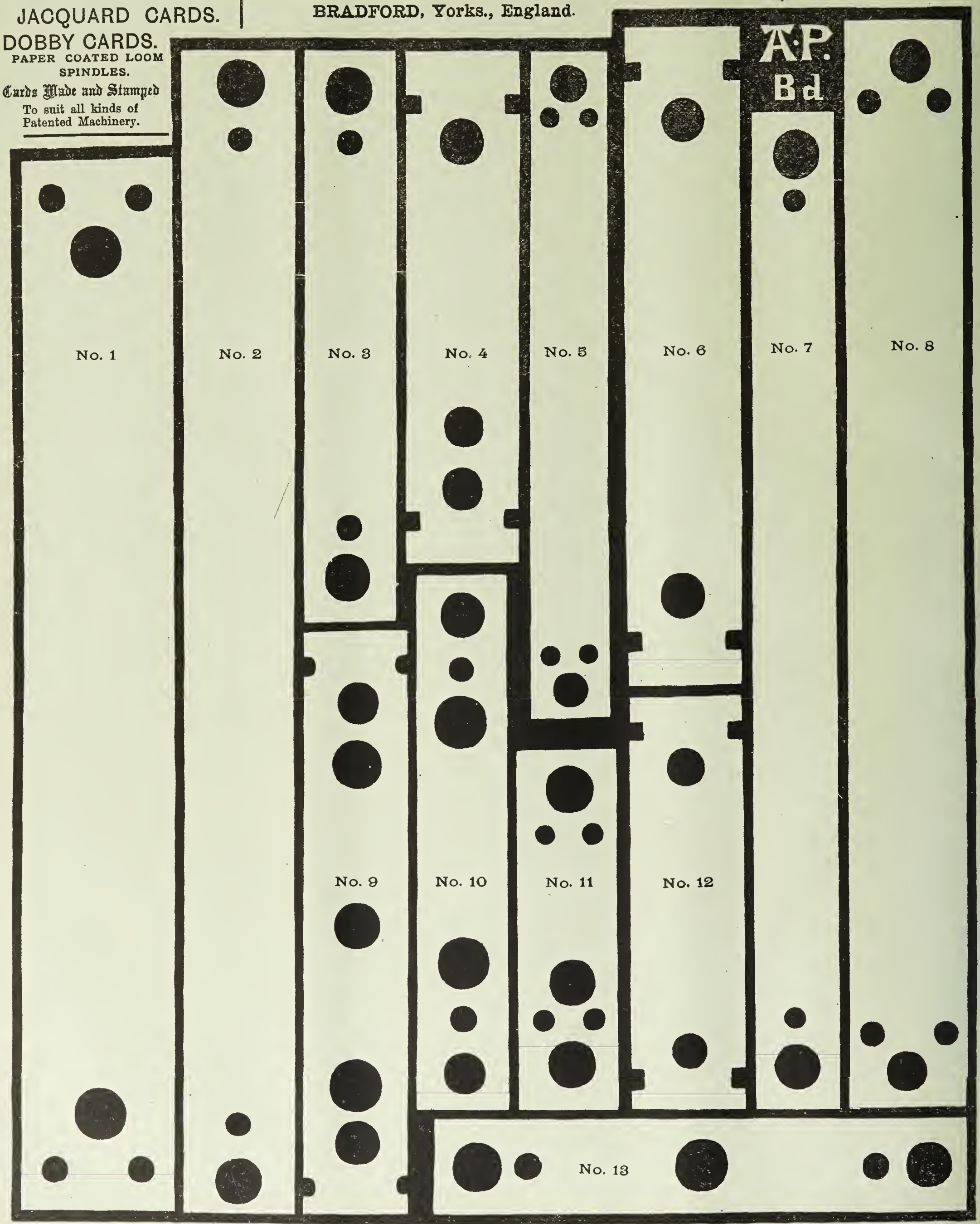
LES BRISEURS DES CARDES À COTON.

Attestation de M. ROBERT PLATT.

Stalybridge, 9 Mai, 1877.

En réponse à votre lettre du 7 ct. j'emploie depuis plus de vingt ans votre système breveté de cardes métalliques et j'en suis très satisfait. Il possède l'avantage d'être beaucoup plus propre et moins cher que le cuir ou tout autre genre de garniturc.

Agent—Mr. C. BORISSOW, Rue a Fiens, 3 ter. Lille, FRANCE.



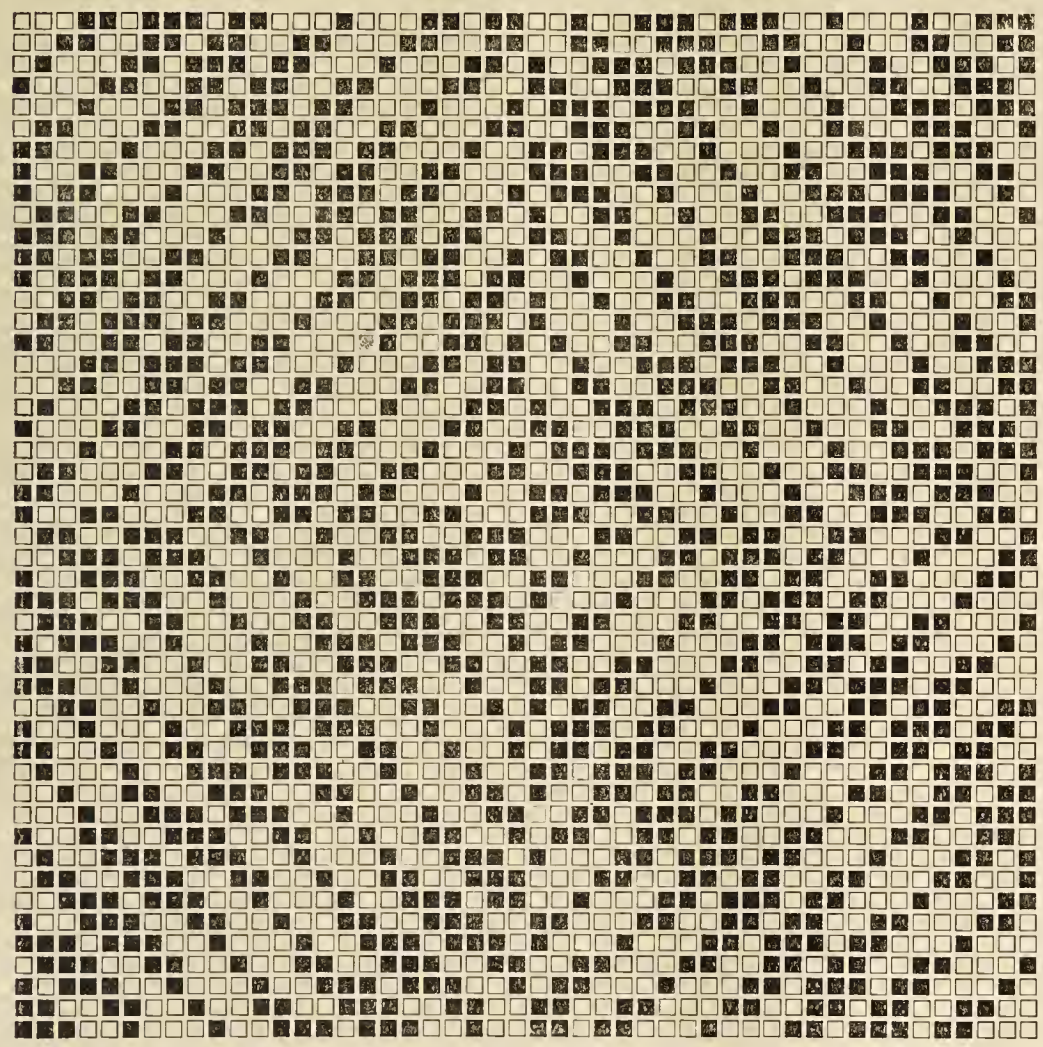

R. Lord

DESIGNED BY S. GARFORTH.


E. Hoyle.

ORIGINAL COATING DESIGNS.

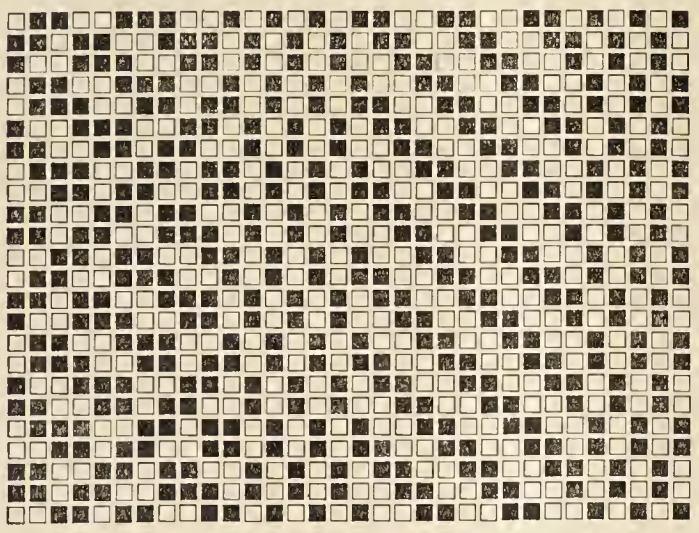
No. 4.



Design.

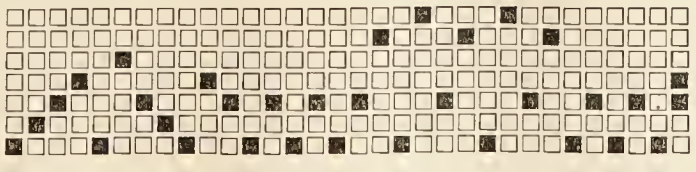
Pattern No. 4 will make a capital reversible Check for a WORSTED COATING. It is a 48-end Pattern. As this Pattern will not weave with less than 32 shafts, manufacturers making use of it will prefer to use the Jacquard. We have therefore omitted the draft.

No. 5.



Design.

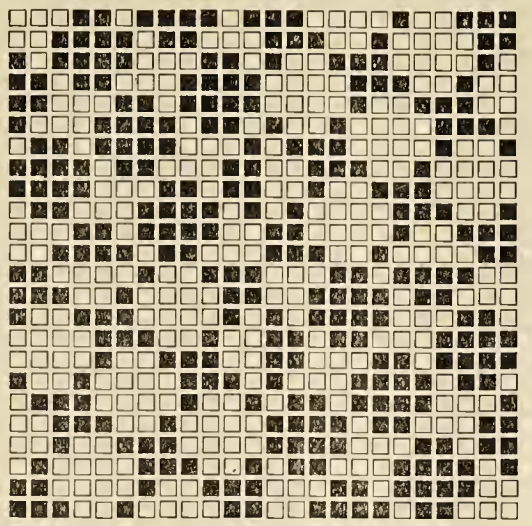
Pegging Plan.



Draft.

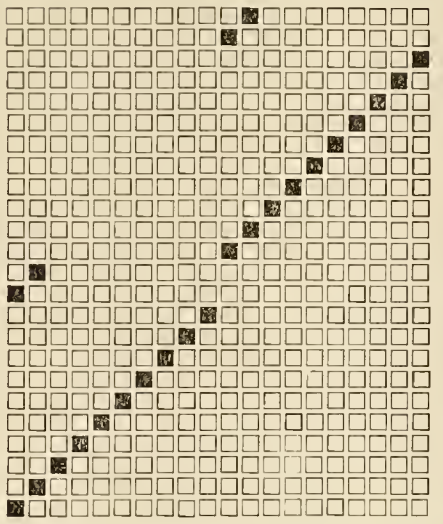
Pattern No. 5 is a neat Stripe for a WORSTED COATING. It is a 32-end Pattern drafted to weave with 7 shafts.

No. 6.

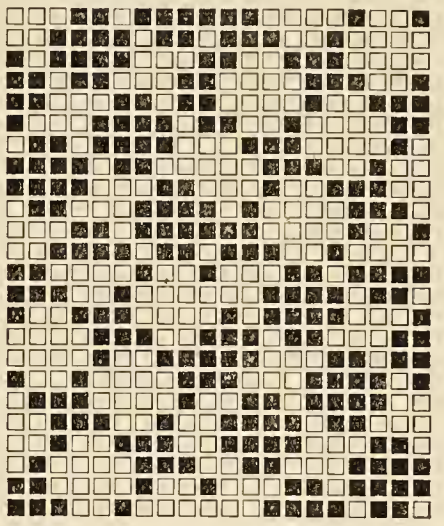


Design.

Pattern No. 6 will make a good reversible Check. It is a 24-end Pattern, drafted to weave with 20 shafts.



Draft



Pegging Plan.

The Electric Railway in the Bleachfield.

The operation of collecting cloth from bleachfields is generally long and tedious. A novel way of facilitating it has been recently introduced at the large linen bleaching works of M. Duchesne-Fournet at Le Breuil-en-Ange (Calvados) by the managing engineer, M. Dupuy. From the account in *La Nature*, we learn that each piece of cloth is 100 mètres long (say 333 ft.), and about 37 acres of ground may be covered. M. Dupuy had long thought of constructing a railway with special mechanism for bringing in the cloth, but a steam engine in a bleachfield is very objectionable on account of the smoke and cinders. The objection does not apply to electricity, and M. Dupuy has had a small line made along the meadows, crossing the ends of the lines of cloth, with a Siemens dynamo-electric machine and collecting apparatus in one vehicle, a set of Faure accumulators, giving the motor force, in another (the tender), and a series of trucks for the cloth. The line is 500 mètres in length and has 21 branches. The train goes to the fields empty. On stopping, the machine is set to actuate the collecting apparatus, to which one end of a piece of cloth is brought. The pieces are previously connected end to end, so that the work goes on continuously. The cloth passes into the locomotive truck, and thence over rollers to a truck attached, in which a man sits to guide it. Thus one man will collect 5,000 mètres of cloth in half-an-hour, an operation formerly taking eleven hours. The train, when loaded, carries 10,000 mètres (over 33,000 ft.) of cloth. The machinery is very easily worked. Moving a lever one way or the other varies the speed of travelling ; a second lever serves for reversal ; and a third to connect the dynamo either with the locomotive or the collecting apparatus. The Faure accumulators in the tender (which are of the Regnier type, large model) are arranged on three shelves and in hampers containing two each. They are 60 in number, and the weight is 500 kilogrammes (1,250 lb.). They are charged with the current of the Gramme machine, which has been used since 1879 in lighting the works. With a commutator on the tender, the number of accumulators employed may be increased by successive additions of six up to 60. The time of action is about three hours. The system, which has been in work about two months, has given entire satisfaction.

The Bleaching of Jute.

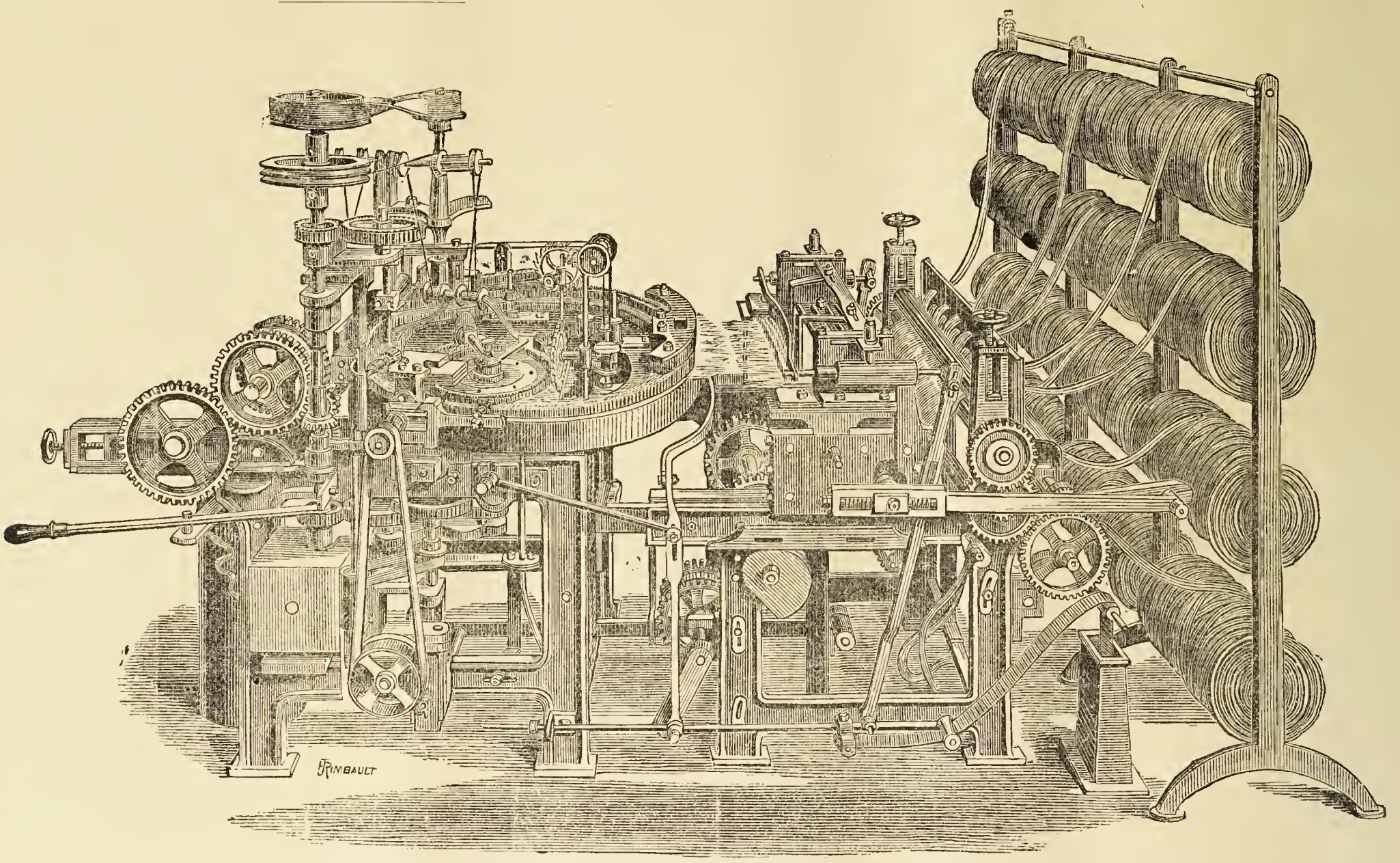
In the bleaching of jute a process for which was given in the last issue, many improvements have lately been brought before the notice of manufacturers of paper and also of other fabrics of various kinds made from jute fibres. According to a recent invention, an improved process is carried out by first soaking the jute fibres in an alkaline sulphide or sulphuret solution of sodium, potassuim, magnesium, calcuim or baruim, until the desired degree of softening has being effected. The jute is then washed and afterwards submitted to the action of a bleaching liquid, composed of a solution of chlorine and an alkali; such as chlorine and soda, chlorine and potash, or chlorine and magnesia, until the material is thoroughly bleached. The treatment may be carried out in either closed or open vessels, and with or without the aid of heat or pressure. The inventor claims as original the bleaching of jute with soluble alkaline sulphides, or sulphurets as above described, and also the treatment of jute which has been previously submitted to the action of an alkaline sulphide with solutions of bleaching compounds; composed of a solution and an alkali, other than the chloride of lime.

MACHINERY, TOOLS, ETC.

Lange's Wool-Combing Machinery.

Messrs. Greenwood and Batley, have furnished us with information relating to Lange's wool-combing machinery, which they are now constructing at their extensive works in Leeds.

Lange's machine introduces an entirely new process, and for the first time combs the whole of the "top," out of the wool before letting it go. This it accomplishes by first combing out the bulk of the "top," and then combing out such portions of "top" as are still left mixed with the noil. It thus obtains a much larger proportion of "top," and leaves nothing but absolute noil to be stripped out of the comb, and go away as noil; instead of having so much "top" mixed with the noil, as to necessitate recarding before the whole can be finally combed. It is another advantage of this machine that it leaves the wool the full length after combing, because it is invariably placed on two combs, which comb the wool by separating; so that it is neither held down by pressing plates, or drawn off with anything like a nip, holding the wool fast.



At a recent meeting of the Paris Société d'Encouragement, M. Simon reported on the process of decortication of rhea or China grass, devised by M. Favier, retired captain of Enginer corps. The greatest drawback to the use of the rhea, or China grass. is said to be the slight proportion of textile filament which it possesses. To reduce the time and expense of preparation, M. Favier places the stalks freshly cut to lengths of five to ten feet, in a wooden receptacle, to which steam is then admitted. The outside covering is then removed very easily by children.

* * * *

The St. Gothard Tunnel has been formally opened. Financially, the St. Gothard route is destined to be a brilliant success. To say nothing of the enormous impetus given to local trade, it will form the best highway to Italy, the Mediterranean, and the East for passengers and goods coming from Great Britain, Germany, Holland, and Belgium. The overland mail, it is anticipated, will adopt it in preference to the Mont Cenis route, which will lose, at least, one half of its traffic. The tunnel has its military censors just like our Channel tunnel; but if Switzerland is in danger from foreign aggression, it is not on the German or Italian side that operations will commence, and, besides, she has an army of 208,200 men to sustain her traditional prowess against her invader.

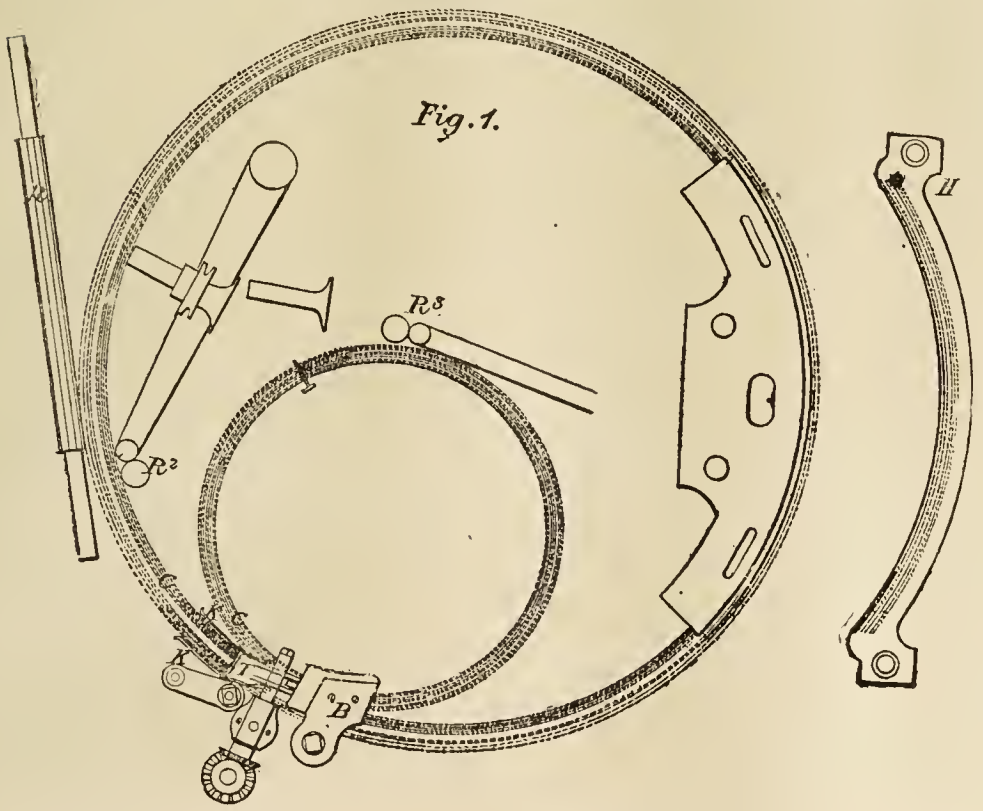
There is a large circular receiving comb, Fig. 1, very like that used in a Lister or Rawson machine, but having more teeth in it as a rule, and at a finer pitch. The head of the machine, with the feeding comb, brings the wool forward and places it on the circular receiving comb and head-comb, into both of which it is pressed by brushes B. The bead recedes, and leaves a combed fringe on the circular comb, while retaining a fringe of combed wool in the head-comb: this latter fringe on the second stroke is lifted and thrown over the circular comb, and is drawn off, farther on in the revolution, from the back (when it is called "backings,") after the front fringe has been drawn off by horizontal rollers. In these operations there is nothing to break the wool.

There are drawing-off rollers both inside and outside of the large circular receiving-comb C. The outside rollers R1, taking the largest quantity of "top," are horizontal, whilst those inside R2, are vertical. Both the slivers from these rollers are run out of the machine togcther, through one "tweedler" or revolving funnel.

There is a small circular receiving-comb *c*, placed inside the large circular receiving-comb C, and almost touching it at one point. At a short distance before this point of coincidence there are lifting knives K, to lift the wool remaining in the large comb out of that comb; and by means of a trough T T, which receives the wool so lifted out in an unbroken state, it is

diverted a little sideways, by about half its width, and is then deposited into the two combs exactly at their point of coincidence. (See detail views, Figs. 2 and 3.) It is dabbed down into them by a quick-acting dabbing brush B, so that, on the continued rotation of the combs, they seperate, and present two combed fringes. Of these fringes, that which projects inside the large comb is allowed to remain in it, and to pass round to the feeding head, where the fresh wool is being fed in. It then passes on, as part of the main bulk of wool in that comb, and is drawn off by the vertical drawing-off rollers R2, inside the large comb. The other clean fringe of long wool, which is left in the small receiving-comb *c*, is drawn off by a third pair of

Fig. 1.



drawing-off rollers R3, and forms an additional or third sliver of clean wool, which is added to the other two, and runs out of the machine through the "tweedler," so as to form one body of clean "top."

The noil remaining in the small circular comb is lifted out by lifting knives K. This is all actual noil, and is used at once for the ordinary purposes for which noil is adapted; it is rather more valuable than the noil ordinarily obtained, as it has had less strain put on it, and is less broken than when it has been subjected to a positive nip in a nipping apparatus. The clean "top" is also more valuable than usual, because it has not been broken

Fig. 3.

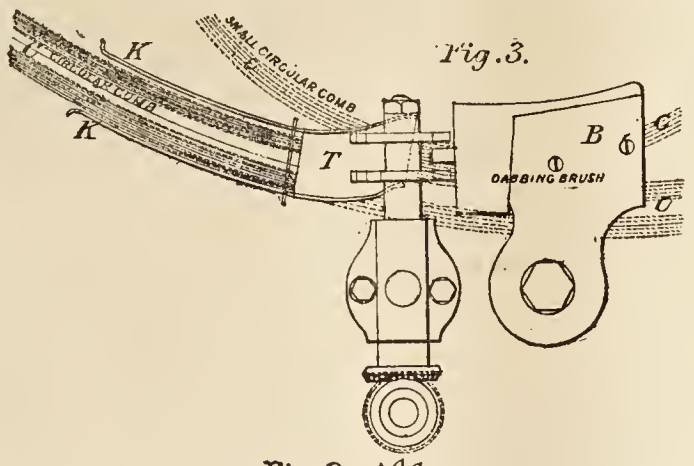
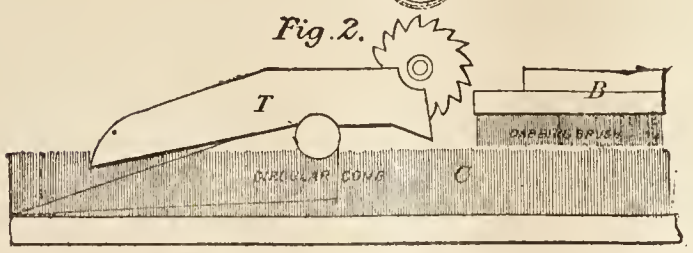


Fig. 2.



or strained in the combing by any nipping apparatus, nor has been violently treated in any way; thus it remains of its full natural length, and can be spun to a higher number or "count."

The proportion of noil to cardings is greatly reduced in this machine, and is in fact the smallest possible. Another very important item is that the machine takes such a heavy feed; and works so fast, that it does much more work in a day than most machines; besides which no part of the wool requires carding over again.

The discussion of the Consular Convention between Brazil and Germany has given rise to much comment in the German commercial papers, which attach great importance to Germany's commercial relations with Brazil. At present most of the requirements of textiles for Brazil are supplied by England, but Alsatian manufacturers have gained a slight footing there recently, and are commencing to export a fair quantity of printed calicoes, jaconnets, woollen shawls, &c., and it is expected that the Consular Convention at present being negotiated will have the effect of further developing German trade with the country.

The Royal Commission on Technical Education.

The members of the Royal Commission on Technical Instruction, have, during the past few weeks, visited some of the most important manufacturing centres on the continent. After leaving Zurich, where they completed their investigations into the school system of the town and canton, and after having inspected some of the more important manufactories, they proceeded to Heidelberg, Stuttgardt, and Munich. At Heidelberg the University was visited, and the opinions of some of the most distinguished Professors were obtained. At Stuttgardt visits were paid to the important Polytechnic, to the Real-Schule, and to the Real Gymnasium, the latter a new school opened a year ago in which a high mathematical and scientific education is given, together with instruction in Latin and modern languages. The system of industrial teaching imparted to apprentices on leaving the primary schools, and which is given in evening classes, and on Sundays, was also investigated. At Munich, Professor Baujer, the discoverer of artificial indigo, informed the Commissioners with respect to the conditions under which chemists in the great colour manufactories in Germany receive their training. The opinions of the most distinguished Professors were obtained with respect to the relative advantages of the university and the polytechnic education in the preparation of students intended for an industrial career. Special attention was given to the art instruction of Munich in its application to trade purposes. The Commissioners spent some time in inspecting the Knust-Tewerbe Schule, where male and female students receive not only a general education in art, but also apply their knowledge to the designing of textile fabrics and of wall papers, to glass and procelain painting, wood and ivory carving, metal chasing, &c. The Commissioners afterwards visited Vienna, where they persued their investigations into the system of industrial education in Austria, and after gathering valuable information at the Austrian capital, and at the chief industrial centres in South Germany, they journeyed to Berlin, where they are busily engaged in making observations.

ODDS AND ENDS.

A movement is on foot for deferring the opening of the Madrid Exhibition from May to September, 1883, as being a more favourable season, and as giving more time to manufacturers to make a good show, as their energies are absorbed in the Spanish-American Exhibition.

* * * *

Signs of industrial activity in Bohemia continue to be reported. It is stated that the Tetschener flax spinning mills, which have been closed since 1876, have been bought by a Prague firm, who propose to establish a starch manufactory there. Another starch works is being opened at Toplowitz, and at Altstadt a soap factory is being erected.

* * * *

Another curiosity of the German Customs tariff is reported in a Berlin paper. An English firm exported a quantity of steel pens in boxes, wrapped in linen wrappers, and the Customs officers actually charged them at the rate of 80 marks per 100 kilos. as "linen goods," instead of 60 marks which they ought to have been charged. The English exporters objected to the charge, and have just had the excess duty refunded to them.

* * * *

The Navarro Indians, a new Mexican tribe, make rugs so closely woven that they are almost waterproof. They are fashioned with rude appliances, and their appearance is very unique. The spinning is done by a machine called a malacate, which consists of a stick about eighteen inches long, upon which is a movable disk. On this the wool is wound, and the operator, holding the simple mechanism in one hand, dexterously spins out the yarn with the other. The process presents a striking contrast to the work performed by the swift-moving machinery of the modern carpet companies. Months are employed in producing a single rug or blanket. The makers prize these goods highly, and are loth to part with them.

* * * *

The total value of foreign trade with British India last year was 141 crores of rupees, compared with 135 crores the year before, which again was greater than the amount of trade in any previous year. The excess of exports over imports in 1880-81 was 16·64 lakhs, or 27 per cent.; the excess of exports over imports 1881-82 was 42 per cent. The treasure imports were 405 lakhs of gold and 647 of silver, as compared with 367 of gold and 532 of silver in the previous year. The United Kingdom monopolises 56 per cent. of the total trade; China takes 14 per cent. It is estimated that the total out-turn of the Indian tea crop of 1882 will be 51,619 000lb.; shipments to Australia and America will probably amount to 2,000,000lb., the local consumption to 1,500,000lb., and 48,000,000lb., will probably be exported to the United Kingdom.

The secretary to the Manchester Chamber of Commerce (Mr. T. Browning), sends us the following particulars relating to the increase of import duties in Switzerland, which came into force on the 21st ult.:—

	Per 100 kilos. Francs.
Leather	8
Carpets, without fringes or sewing	12
Other classes of carpets	30
Woollen yarn, single or double	5
Ditto, bleached, thee or more fold	8
Ditto, dyed	9
Worsted tapes and ribbons	30
Blankets, woollen, without sewing of any kind	16
Woollen tissues, grey	12
Ditto, bleached, dyed or printed	25
Cloth lists	4
Worsted and woollen smallwares and hosiery	25

On cotton goods and yarns the duties remain unchanged.

* * * *

Commenting upon the wholesale emigration of Jews from Russia, a Vienna paper remarks that it has inflicted serious injury upon the country's trade with the rest of Europe, and upon manufacturing firms in England, France, Austria, and Germany. Reports from the Leipsic fair show that never were less goods imported from or exported to Russia than at the present fair. Austro-Hungarian woollen merchants have been also seriously affected, through the non-payment of their accounts for goods delivered and by the non-fulfilment of contracts entered into prior to the beginning of the troubles. Referring to the same subject, the St. Petersburg correspondent of the *Times* says:—Commerce and industry are suffering in an unprecedented degree. Business men are complaining loudly, especially those whose trade depends upon the confidence and credit given by commercial houses abroad. Even the Moscow Exhibition bids fair to become a failure. The number of exhibitors from an empire of 90,000,000 of subjects is only counted at about 2,000, and many of these have not yet been able to send their goods. Foreign houses express so much mistrust that, as business men on' Change remark. twenty or thirty telegrams have now to be exchanged with houses abroad before one transaction can be carried through.

THE GAZETTE.

Adjudications of Bankruptcy.

Bridgewater Thomas and Francis Foster Bridgewater, trading as Bridgewater Bros., Fairfield Mills, Cleckheaton, woollen manufacturers.

Maggs Oliver, Bourton, Dorset, flax spinner and manufacturer.

Liquidations by Arrangement or Composition.

Bradbury Joseph and Hervey Bradbury, trading as Joseph Bradbury and Son, Batley, woollen manufacturers.

Greenwood William Watson, trading as William Watson Greenwood and Co., Bradford, stuff manufacturer.

Hammond John Thomas, Depot Mills, Macclesfield, silk dealer.

Barraclough Frederick Albert, Manchester Road and Little Horton Lane, both Bradford, stuff finisher.

Brown William, trading as William Brown and Co, Milton Place and Sun Works, both Halifax, damask manufacturer.

Birtwistle John, George Birtwistle and David Birtwistle, trading as John Birtwistle and Bros., Great Harwood, Lancashire, cotton manufacturers.

Shaw Richard Billington, Rook Street and Claremont Road, Moss Side, both Manchester, worsted merchant.

Constantine Zephaniah, trading as Z. Constantine and Co., Cater Street, Bradford and Burley-in-Wharfedale, Yorks., stuff yarn and cloth merchant.

Crossley John and Lewis Crossley, trading as Thomas Crossley and Sons, Lee Bridge Dye Works, Halifax, dyers and finishers.

Sequestrations.

Thomson James and Son, Kilmarnock, manufacturers, and James and Neil Thomson, the Partners, and as individuals.

Trustees Appointed.

Turner Abraham (Liquidation), Elland, Halifax, cloth finisher. Trustee, F. Foster, Halifax, accountant.

Cockroft Dan, Sam Cockroft, William Cockroft and Joseph Chambers (Liquidation), Ovenden, Halifax, worsted spinners. Trustee, F. Whitaker, Halifax, auctioneer, appointed in place of S. J. Beswick, removed.

Denby John and John R. Beard (Liquidation), Faulkner Street, Manchester, and Macclesfield, silk manufacturers. Trustee, A. Murray, 104, King Street, Manchester, accountant.

Shackleton William (Bankrupt), Springwood Mill, near Todmorden, cotton spinner. Trustee, T. Crowther, Todmorden, accountant.

Dividends.

Ford William J. and James King (Liquidation), Friars Causeway, Leicester, hosiery manufacturers. 1st dividend, 5s.; R. S. Mantle, at Wykes Bros. and Mantle's, Friar Lane, Leicester.

Longworth Edward, trading as E. Longworth and Co. (Liquidation), Deighton, Huddersfield, and Thurlstone, woollen manufacturers. 1st and final dividend, 1s. 3d.; W. H. Armitage, 23, John William Street, Huddersfield, accountant.

Wiley Arthur John and Edwin Rowley (Liquidation), Huddersfield and Stoney Bank Mill, near New Mill, woollen manufacturers. 1st and final dividend, 1s. 11¾d.; W. O. Clough, 23, John William Street, Huddersfield, accountant.

Turner Joseph B., trading as J. B. Turner and Co. (Liquidation), Huddersfield, woollen manufacturer. 2nd and final dividend, 5s. 0½d.; J. E. Eastwood, at Sharpe and Sharpe's, Huddersfield, accountants.

Washington George and Isaac S. Washington, trading as Washington Bros. (Liquidation), Halifax, waste dealers. 1st and final dividend, 6s. 4d.; J. Crowther, Portland Place, Elland.

Fretwell John (Liquidation), Halifax, late Barnsley, dyer. 2nd and final dividend, 3s. 8d.; J. Wood, Crown Street, Halifax.

Gledhill John (Liquidation), Golcar, Huddersfield and Longwood, woollen cloth manufacturer. 1st and final dividend, 7s. 5¾d.; W. O. Clough, accountant, 23, John William Street, Huddersfield.

White Greenwood, trading as Greenwood White and Co. (Bankrupt), Hewenden Mills, near Bingley, stuff manufacturer. 1st and final dividend, 11¾.; B. Musgrave, Bank Street, Bradford, accountant.

Dissolution of Partnerships.

Russell and Ramsden, Great Junction Street, Leith, wool merchants, &c. Debts by John Russell and Charles L. and Henry Ramsden, who continue the business.

Dalgleish and Kerr, Blantyre, cloth manufacturers. Debts by Robert Kerr, who with J. De C. Ballardie, continues the business as the Blantyre Weaving Company.

Kennedy N. and Co., Cochrane Street, Glasgow, manufacturers. Debts by Donald Shaw and Andrew Guthrie, who continue the business.

Andrew J. and Sons, and E. and F. Andrew, Ashton, cotton spinners.

Ardern and Son, trading as Lawrence Ardern, Stockport and Hazel Grove Mills, near Stockport, thread manufacturers. Debts by Lawrence Ardern, Junr.

Bell, Main and Larrad, Leicester, hosiery manufacturers.

Comer, Harrison, Hoyle and Hoyle, trading as Sharneyford Spinning and Manufacturing Company, Sharneyford Mills, near Bacup, cotton spinners.

Crich and Harrison, New Basford, lace manufacturers.
Porritt Arthur and Co., Gomersal, Birstal, silk spinners. Debts by Arthur Porritt.
Schofield and Broome, Oldham, cotton spinners.
Greenwood and Whitaker, Whitehall Road, Leeds, woollen manufacturers.
Hargreave and Nussey, Leeds, cloth manufacturers. As regards James Riley Whatmough
Harrop and Wrigley, Oldham, cotton doublers. Debts by William Harrop.
Hollins Samuel and Co., Astley Bridge, near Bolton, cotton and merino spinners.
Hooper Cleeve W. and Sons, Weston Street, Bermondsey, hide and bark factors. As regards Cleeve W. Hooper.
Hopwood Dean and Orrah, Huddersfield, woollen and Bedford cord manufacturers.
Howorth James and Co , Rochdale, cotton manufacturers.
Harper Taylor and Little, Bradford, woollen cloth manufacturers.
Mackay and Co , Cheltenham, fellmongers and woolstaplers. Debts by John Matthews
Marshall R. and A , Bridge Croft Mills, Milnsbridge, yarn spinners.
Pickles, J. and D , trading as Robert Pickles, Cowling, Kildwick, Yorks, commission weavers
Raistrick J. and Sons, Thackley, Idle, cloth manufacturers. Debts by George Raistrick.

Bills of Sale.

Armitage Joseph, Joe Armitage and Sam Haigh, Meltham, Almondbury, near Huddersfield, woollen cloth manufacturers, for £3,200, mortgage to James Haigh.
Cooper R. B., Walk Mills, Kingswood, Gloucestershire, woollen cloth manufacturer, for £340 to J. V. George.
Dewhurst H. T., Salford Mill, Todmorden, cloth manufacturer, for £460, to M. Stuttard.
Good W. M., Marian Villa, Nottingham, lace manufacturer, for £50, to J. Harrison.
Hinchliffe G., Primrose Hill, Huddersfield, woollen cloth manufacturer, for £105, to J. Hinchliffe.
Simms G., California Mills, Stockport, cotton spinner, for £56, to J. Fineberg.
Hawkins J , Moss Lane, Urmston, near Manchester, cotton manufacturer and agent, for £45, to J. F. Townend.
Lomax J., Collinson Street, Alfreton Road, Nottingham, lace manufacturer, for £550, to H. Taylor, Junr.
Barnes J., 21, Cannon Street, Manchester, grey cloth commission agent, for £100, to J. Fildes.
Tetley W., Shed Mill, Pudsey, near Leeds, woollen manufacturer, for £200, to William Houghton and another.
Wheater W. A., Havelock Works, Leicester, yarn merchant, for £50, to Union Loan Company.

PATENTS.

Applications for Letters Patent.

2021 Edward Mansfield, Ambler Road, Finsbury Park, Middlesex, "Improvements in and connected with the cleaning and removing of oily and other extraneous matters from wool, cotton waste, and other fibrous animal and vegetable materials and fabrics, and in apparatus therefor."
2029 Daniel Thomas Gardiner, 166, Fleet Street, London, "Improved process and ingredients for treating and preparing woven fabrics, skins, furs, hides, and leather generally, also for waterproofing such articles or goods without destroying the ventilating properties thereof."—A communication.
2051 Thomas John Mullins, 16, George Street, Mansion House, London, gentleman, and William Whiteley, of the firm of William Whiteley and Sons, Lockwood, Huddersfield, machine makers, "Improvements in or applicable to machinery employed in washing wool or other fibres."
2038 James Hamilton, Strathaven, North Britain, "Improvements in weaving fancy fabrics and in looms for the same."
2042 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in and relating to temples for weavers' looms."—A communication.
2069 John Aspinall, Ravensthorpe, near Mirfield, power loom turner, "Improvements in the method of and apparatus for connecting and supporting healds in looms for weaving."
2079 Henry Harris Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in machinery for drawing, combing, or otherwise preparing wool or similar fibrous material."—A communication.
2090 John Brownlee, Glasgow, "Improvements in or connected with looms for weaving."
2178 Joseph Anthony Dixon, 151, St. Vincent Street, Glasgow, solicitor, "Improvements in the production of colouring matters suitable for dyeing and printing."—A communication.
2183 Alexander Melville Clark, 53, Chancery Lane, Middlesex, "Improvements in machines for dressing silk and other fabrics."—A communication.
2196 Henry Cheetham Hill, of Stalybridge, cotton spinner, and Henry Hill Brown, of the same place, mechanic, "Improvements in machinery for winding cotton and other yarn and thread."
2202 Samuel Clayton, of Bradford, engineer, "Improvements in motor-engines worked by gas or combustible vapour and air."
2220 Alfred Henry Horsfall, of Coventry, manufacturer, "A new or improved mode or means of ornamenting ribbons and other useful and ornamental articles."
2246 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in differential pulley apparatus."—A communication.
2252 Thomas Richards Harding and Thomas Walter Harding, both of the Tower Works, Globe Road, Leeds, card, comb, and pin manufacturers, "Improvements in the steel-pinned covering for rag and waste tearing or grinding and other analogous machines."
2253 Henry Hall, of 2, Rutland Gate, Blackpool, "Improvements in machinery for spinning and doubling."
2254 Thomas Anderson, of Liversedge, "Improvements in the manufacture of figured pile fabrics."
2255 John Kiddier and Herbert Kiddier, of the firm of John Kiddier and Sons, of Nottingham, hosiery machine makers, "Improvements in machinery and apparatus employed in the manufacture of looped fabrics."
2262 Frederic Stanton and Edwin Stanton, of "The Silk Mills" (Armoury), Lewisham, Kent, gold and silver wire drawers and gold thread manufacturers, "Improvements in the construction or arrangement of apparatus or appliances for the manufacture of 'purl' and 'bullion' used for embroidery purposes."
2283 Frank Wirth, of the firm of Wirth and Company, patent solicitors, Frankfort-on-the-Main, Germany, "Improvements in the manufacture of gold and silver thread and other objects or articles from animal membrances."—A communication.
2287 Freierich Carl Glaser, Berlin, Prussia, engineer and patent solicitor, "Improvements in the treatment of linen and other fibre for increasing the fineness, lustre, and softness thereof."—A communication.
2290 Bryce Muir Knox, Kilbirnie, North Britain, "Improvements in machinery for winding yarn or thread."
2292 Edward Briggs, Briggella Mills, Bradford, "Improvements in the manufacture of woven fabrics."
2328 Frederick James Smith, Heywood, "Improvements in machinery or apparatus employed in doubling cotton and other fibrous substances."
2386 Lorentz Albert Groth, K.G.V., civil engineer, 30, Finsbury Pavement, London, "Improvements in drawing apparatus for continuous spinning machines."—A communication.
2388 Charles Denton Abel, 28, Southampton Buildings, Chancery Lane, Middlesex, "Improvements in machinery for combing wool and other fibre."—A communication.
2417 James Nuttall, Farnworth, Lancaster, and John Pitt Tapley, Patricroft, "Improvements in ring frames for spinning and doubling."
2422 John Darling, Glasgow, and James Darling, Shotts, "Improvements in indicating the length of cloth or other fabrics in rolls thereof, the same being applicable for checking lengths cut off therefrom, and for proving to customers the lengths thereof purchased and received by them."
2463 Thomas Stead, Leeds, "An improved means or apparatus for lifting or raising and carrying cloth and other fabrics."
2467 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in cotton-presses."—A communication.
2469 William Phillips Thompson, 6, Lord Street, Liverpool, and 323, High Holborn, Middlesex, civil engineer, "Improvements in or relating to shuttle-box or revolver apparatus for looms."—A communication.
2478 John Ashworth, Rochdale, machinist, "Improvements in mechanism applicable to tentering, stretching, printing, calendering, and other machines for treating and manufacturing fabrics."
2481 William Thompson, Blackburn, manufacturer, "Improvements in looms for weaving."
2483 William Edward Gedge, 11, Wellington Street, Strand, London, patent agent, "Improvements in universal embroidering machines."—A communication.
2502 William Mould and Thomas Grimshaw, Preston, "Certain improvements in machinery or apparatus to be used in connection with looms for weaving."
2510 Arthur William Lovell Reddie, 66, Chancery Lane, patent agent, "Improvements in frames for the manufacture of stay laces, braid, and other plaited goods."—A communication.
2523 John Clayton Mewburn, 169, Fleet Street, London, patent agent and consulting engineer, "An improved process and apparatus to be employed in dyeing, bleaching, or otherwise operating upon threads, slivers, and other textile materials."—A communication.
2535 Henry Lomax, Darwen, machinist, "Improvements in looms for weaving."

Grants of Provisional Protection for Six Months.

1447	1502	1520	1538	1566	1586	1610	1634
1646	1673	1718	1724	1732	1736	1773	1775
1807	1810	1829	1860	1861	1894	1905	1910
1921	1925	1958	1966	1968	1978	1996	2008
2021	2029	2038	2040	2042	2051	2058	2069
2079	2090	2145	2183	2196	2254	2262	2388

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38	63	91	167	171	233	307	312
427	429	430	460	492	551	594	601
604	691	863	1350	1374	1418	1488	1538
1590	1634	1673	1724	1784	1860	1927	1978
2031	2042	2178	2388	5692	5726		

Patents Sealed.

115 William Birch, Salford, machinist, "Improvements in the construction of apparatus employed in washing soaping, dyeing, and other similar operations."

304 Thomas Watson, Ferguslie Works, Paisley, foreman mechanic, "Improved oil cap in wharve of spindle for spinning and doubling."

323 Benjamin Alfred Dobson, of the firm of Dobson and Barlow, machine makers, Bolton, Edward Gillow, foreman, and David Davies, mill manager, Bolton, "Improvements in spinning machinery."

465 John Byfield, London, Canada, "Improvements in knitting-machines."

478 Herbert John Haddan, Kensington, Middlesex, "Improvements in process and apparatus for disintegrating jute and fibrous stalks."—A communication.

867 Henry Blackford Payne, Nottingham, "Improvements in the carriages of bobbin-net or twist-lace machinery."

876 George Perkins, George Wimpenny, and Joseph Hampson Evans, Manchester, "Improvements in spinning machinery."

899 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in cotton opening and lapping machines, and in the manufacture of laps thereby." —A communication.

1157 Robert Barff Thomson, Dundee, engineer, "Improvements in and connected with spinning-machine spindles."

1245 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in creels for spinning machinery."—A communication.

1337 Alexander Melvile Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in the manufacture of twisted and woven fabrics and in machinery therefor."—A communication.

1360 Herbert Sumner of Manchester, "Improvements in gas-motor engines."

1503 Alexander Melville Clark, 53, Chancery Lane, Middlesex, patent agent, "Improvements in machinery for opening and cleaning cotton." —A communication.

3896 William Lancaster, machine maker. Accrington, and Edward Slater, Burnley, "Certain improvements in machinery for spinning, doubling, and winding yarns."

4847 George Little, Oldham, mechanical engineer, "Improvements in machinery employed in 'preparing' wool, cotton, and other fibres."

4894 William Harrison, 128, Portland Street, Manchester, mechanic, "Improvements in knitttting-machines."

4954 Aaron Metcalf, Preston, machinist, "New or improved apparatus for producing double crossing motion for self-acting mules for spinning and doubling."

4986 Elliott Hallas, Huddersfield, York., india-rubber merchant and mill furnisher, "Improvements in pickers employed in looms for weaving."

5016 John Hawthorn, Peter Hawthorn, and John Pemberton Liddell of the firm of John Hawthorn and Company, of New Mills, engineers, "Improvements in apparatus for soaping, washing, or treating woven fabrics."

5031 Matthew Dickie, of Stockport, "Improvements in the construction of apparatus employed in spinning and doubling cotton and other fibrous substances."

5056 Arnold Edmund Robinson and Horace Robinson, both of Manchester, "Improvements in hot-air engines"

5059 Edmund Edwards, of the firm of Edwards and Co., patent agents and engineers, of 40, Southampton Buildings, Chancery Lane, Middlesex, "Improvements in machinery or apparatus for carding and spinning cotton or other fibre."—A communication.

5086 Henry Moses Mellor, of the firm of Moses Mellor and Sons, Akroyd Street, Nottingham, "Improvements in knitting-machines."

5089 Albert Smith, of Bradford, spinner, and Michael Firth, of the same place, combing overlooker, "Improvements in machinery for combing wool, cotton, silk, flax, and other fibrous substances."

5114 Abraham Place, of Macclesfield, Chester, "Improvements in jacquard-machines."

5134 William Thomas Emmott, Manchester, "Improvements in apparatus for spinning wool and other fibres."—A communication.

5135 Frederick Ripley, worsted spinner and manufacturer, and Thomas Hargreaves Brigg, machine maker, Bradford, "Improvements in spinning machinery."

5152 Joshua Henry Wilson and Lawrence Wilson, Cornholme, Todmorden, bobbin manufacturers, "Improvements in and applicable to the bobbins, tubes, skewers, and picking-sticks used in textile machinery."

5161 William Raven, Leicester, hosiery manufacturer, "Improvements in the manufacture of ribbed hose and socks."

5174 Leeming Webster, Dewsbury, machine maker, "Improvements in machinery employed in washing, scouring, and dyeing fabrics."

5180 Thomas Bradford, Manchester, "Improvements in the construction of machines used for washing, wringing, and mangling, part of which invention is also applicable to churns."

5188 John Bullock, Accrington, machine maker, "Improvements in looms for weaving."

5203 James Kerr and Joseph Hawthorn, Church, "Improvements in machinery or apparatus for printing fabrics."

5218 Frederick William Fox, Windhill, York, spinner, "Improvements in the method of and apparatus for spinning, twisting and drawing fibrous substances."

5258 Joseph Walton Merrall, Morton, near Bingley, worsted spinner, "Improvements in rings employed in machinery for spinning and twisting wool, cotton, and other fibrous substances."

5282 Edward Horsfall, Thornton Road, Bradford, yarn doubler, "Improvements in machinery or apparatus employed in the manufacture of fancy yarns."

5292 John Leyland, Bolton, spindle and fly maker, "Improvements in the construction of apparatus, for spinning cotton, flax, jute, worsted, and other fibrous materials, also for doubling and twisting the same."

5594 Benjamin Joseph Barnard Mills, 23, Southampton Buildings, Middlesex, patent agent, "Improvements in knitting machines or looms."—A communication.

5645 John Walker, of Hyde, "Improvements in the construction of machinery or apparatus employed for preparing and spinning cotton and other fibrous materials."

5713 Charles Wood Lightoller, Manchester, and James Longshaw, Preston Brook, "Improvements in the treatment of yarn and other goods made from cotton."

Patents on which the Stamp Duty of £50 has been Paid.

1709 Isaac Holden, of the firm of Isaac Holden and Sons, machine wool combers, Bradford, "Improvements in apparatus employed in carding wool and other fibres."

1838 Luke Woodward and Frederick Chadwick, both of Lee Works, Arkwright Street, Nottingham, "Improvements in knitting-machines."

1956 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in feeding apparatus for drawing-frames and similar machines employed in the dressing or preparation of hemp or other fibrous materials."—A communication.

1957 William Robert Lake, of the firm of Haseltine, Lake and Co., patent agents, Southampton Buildings, London, "Improvements in feed-regulating apparatus for drawing, twisting, or spinning machinery."—A communication

2129 James Barbour, Belfast, machinist, "Improvements in spinning and twisting frames."—A communication.

Patents on which the Stamp Duty of £100 has been Paid

1618 John Jackson Ashworth and George Ashworth, Pendleton, manufacturers, "Improvements in machinery for warping."

1669 William Henry Hacking and Thomas Hacking, Bury, machine makers, "Improvements in machinery for weaving and folding cloth."

2161 Henry Edward Newton, 66, Chancery Lane, Middlesex, civil engineer, "Improvements in ornamenting or producing patterns or designs of various kinds on fabrics, and in the apparatus to be used for such purposes."—A communication.

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